IRON AGE editorial

All For One, One For All

THE defense program is building up to a bang that will be heard over in Moscow and then back here again. The order volume has gone up fast in the past month. Mr. Wilson may have labor pains but he certainly started the military going on what they feel they need with actual orders. A lot of firms have gotten orders that they had only vaguely heard about several months ago.

It is true that a lot of stuff has not been made yet. But it is just as true that a lot will be in process soon. That processing will drive home just what America is going to do about keeping the peace. These are no idle words. They have been confirmed by people who have seen the handwriting on the wall and have orders on hand.

Many firms fear—with reason—that the changeover period will be drastic and dangerous to our economy. It will be drastic but whether it will be dangerous is a joint responsibility of government, labor and industry. So far it looks as if we are going to have a little trouble. That trouble may be manpower and it may mean temporary layoffs.

We may have conditions where men are being laid off in one town while in another there is an extreme manpower shortage. Everyone is going to have to pitch in and keep such conditions to a minimum. We seem to be making a lot of the same mistakes we made in World War II. How soon we recognize that they are mistakes and do a right-about-face will determine whether or not we slow up or foul up the defense effort.

A lot of companies with prime contracts want subcontractors. Some don't know how to get them. Others are past masters at the game of finding the man with the right plant, the right capacity and the right type of workers. Most of the prime contractors will have to check and look around. Every news item or story that tells about a prime contract can be helpful to those looking for subcontract work. It is a big job. It almost staggers the imagination.

The editors of THE IRON AGE are trying to do their small part in this big job. This week we are starting a new service to bring prime contractors and subcontractors together. On p. 93 of this issue we list some products that "are looking for subcontractors." Frankly, it is an experiment. If prime and subcontractors want it, use it, and cooperate, it will be continued and expanded.

Only by using the old Three Musketeers' slogan, "All for one, one for all" can the defense program be properly distributed throughout the economy.

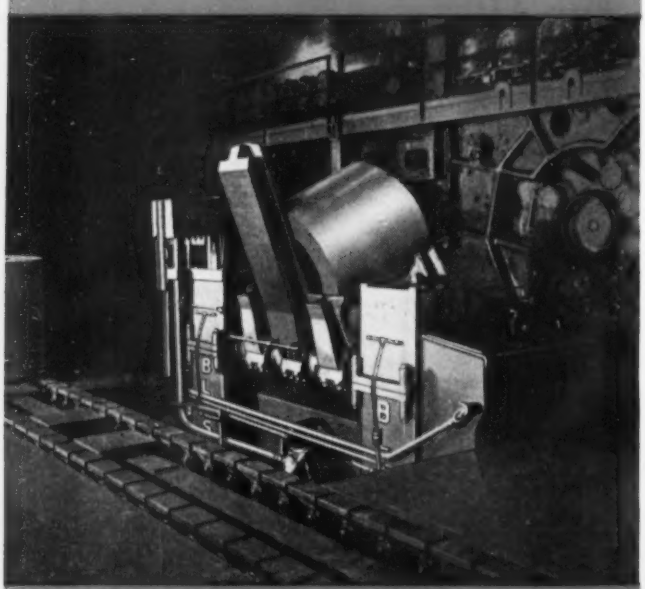
Tom Campbell

Editor

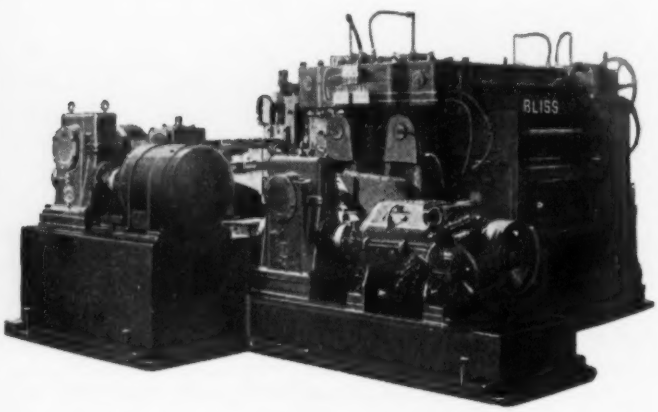
HOW BLISS DESIGNS FOR STEEL, BRASS

PRIMARY METAL PLANTS use hundreds of Bliss special-purpose machines in conjunction with hot and cold reduction mills. In every case, backed by field research with industry's engineers, Bliss has drawn upon its engineering skills to create equipment combining the necessary ruggedness and precision for the job at hand.

Pictured on these pages are typical exam-

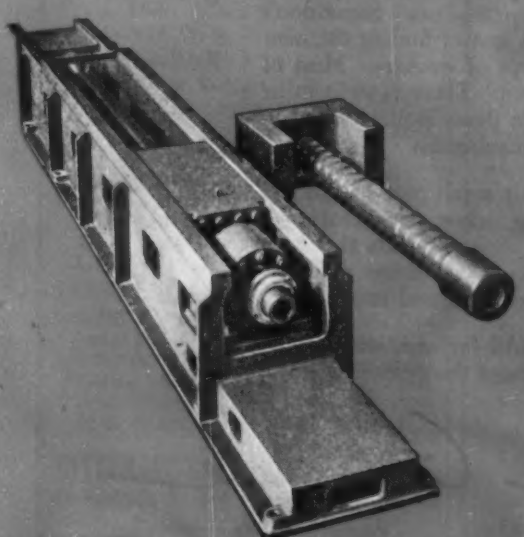


COIL UPENDER strips hot 25,000-pound coils from the Mandrel Coiler, upends and deposits them on a "waffle top," which in turn deposits coils on the moving conveyor strands without damage to coil edges.



13 ROLL BREAKER produces scale-free and inclusion-free product which is suited for final reduction operations.

RUN OUT DELIVERY TABLE specially designed by Bliss has slab sweep-off sections opposite piler. A slab pusher is provided on one side.



ROLL CHANGER WITH SLIDING RAIL permits easy roll removal from the mill and reduces required crane capacity. Balance bar is used to handle work roll assemblies including chocks and bearings.

IRON AGE *newsfront*

news methods and product forecast

► The Air Force program for big forging and extrusion presses has been boosted by $50 million to $250 million. One Air Force supplier has told Washington he could use a 125,000-ton forging press and his suggestion is being seriously considered.

► A European firm has developed a machine to make shot of the type used in shotgun shells out of lead wire—replacing the drop tower method now generally used.

► The NPA order permitting business and industry to establish their own priority for maintenance, repair and operation (DO-97) has shown up sharply at the warehouse level. Some warehouses report that every third order they get carries the DO-97 symbol.

► By removing buckstays, an American steel company has reduced charging time on an openhearth furnace. Large sections of scrap are charged through space normally occupied by three center doors. Scrap is pushed into the furnace from a special charging box that remains horizontal during charging. Hot metal is charged through either of two end doors.

► At least one major automobile company believes it won't be too long before gas turbines power automobiles. A top executive of this company has privately said that its current new engine is the last one his company will design.

► By 1953 all nickel from current sources in the U. S. and Canada will be mined by shaft methods. The amount shipped from open pits will be negligible this year. Exhaustion of open pit sources will force costs and prices up.

► Government attempts to get "undivided loyalty" in Washington operations leads federal officials to demand that trade association executives disassociate themselves entirely from their organizations and work only for the Government. Relatively low government pay means many trade association heads will turn down jobs offered them on industry advisory committees.

► Alloy irons for automotive dies are temporarily out the window. Chances are dies will soon be made of straight gray iron or nodular iron, with steel inserts at wear points. They won't have the life of alloy irons—but auto body die work will probably end soon anyway.

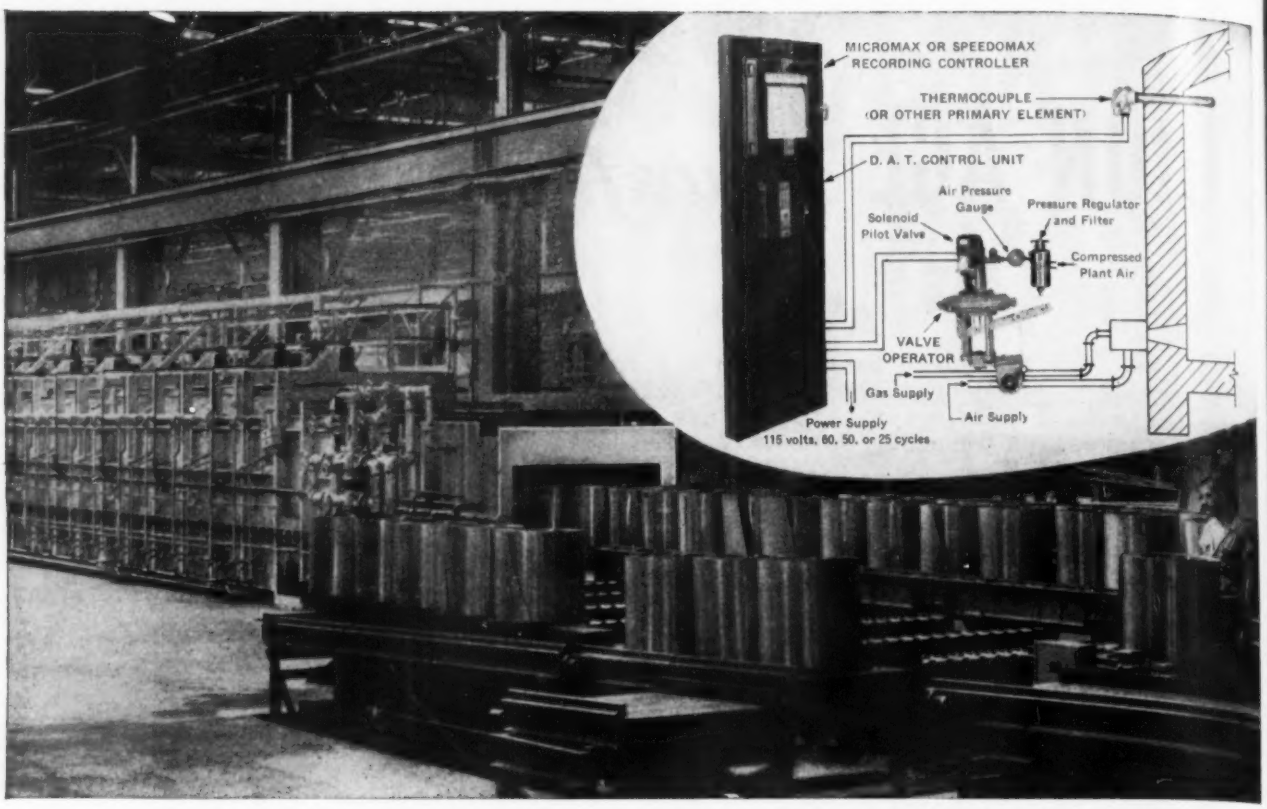
► The Air Force and the Navy have been placing machine tool orders to get position on the order books for future requirements. These are really small pool orders.

► One automobile company has made as many as 10,000 valves a day by the shell mold, or Croning process.

► Military and other essential programs are taking more and more flat-rolled steel. One big producer is shipping 70 pct of its plate under DO or on programs. Another estimates that only 10 pct of its hot-rolled sheet output will be available for non-essential customers in May.

► The current Air Force program on pure machinability research involves expenditure of $1 million. Work reported upon so far is only a small phase of the program.

See "Can You Make It?"—New Iron Age subcontracting service, on p. 92.



One of four 119-foot annealing furnaces built by Surface Combustion Co., and The Electric Furnace Co., for Scovill Manufacturing Company's new $10 million continuous strip mill. Crediting L&N D.A.T. pyrometric control on all these furnaces, Scovill says: "D.A.T. is taking a big part in helping us turn out the most uniform, high-quality brass we've ever made." Sheet is annealed in 2,000-lb coils; capacity is 32,500 lbs. per hour per furnace.

THIS "PACKAGE" OF CONTROL FITS ITSELF TO FURNACE NEEDS

And Only L&N Can Supply All Its Features!

SCOVILL'S latest success in controlling temperatures in brass strip-annealing furnaces is doubly interesting because it shows what can be done with other thousands of industrial furnaces. Small units may need only one instrument, instead of Scovill's five per furnace, but the principle's the same. Any furnace which can be controlled by turning fuel "on" at a predetermined low temperature, and turning it "off" at a predetermined high, will get its best possible regulation by D.A.T. Control.

D.A.T. excels for two reasons. First, it takes the "predetermined" out of the on-off action. Second, it adds full proportioning action. Instead of operating at predetermined temperatures, D.A.T. acts earlier or later, depending on change in heat demand. Only D.A.T. supplies all these features.

Increased production resulting from unusual uniformity is the great advantage of D.A.T. but other points are worth remembering: (1) Fuel can often be saved because less heat is lost up the stack. (2) Valve and burner sizes are not particularly critical. (3) D.A.T. can often modernize an old furnace, because it's so easy to install.

D.A.T. is just one of several L&N Controls. Call us for service or information in selecting equipment for any temperature-control problem. Address nearest office or 4956 Stenton Ave., Philadelphia 44, Pa.

TYPICAL RESULTS

- **D.A.T. exactly adapts its action to the upsets, load changes and lags of the furnace. This means it holds temperature in line for all normal changes in furnace charge, ambient temperature, temperature control point, etc.**
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- **D.A.T. operates equally well on furnaces of full-muffle, semi-muffle, open firing and conventional radiant-tube design.**

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IRON AGE *summary*

iron and steel industry trends

Gray market flourishes under price ceilings . . . Regulations indirectly give official status to fantastic prices . . . Mills tighten market control

Legal Loophole—A healthy steel gray market is flourishing under government pricing regulations. Fantastic steel prices (2 to 4 times those charged by regular producers) never were illegal. But they were considered unethical, and were subject to scrutiny, investigation and remedial action by government and industry. Now these prices indirectly have official government sanction because the pricing regulations permit steel to be sold for prices received during the base period Dec. 19 to Jan. 25.

Regular mill steel is subject to a voluntary agreement signed by steel producers. But gray market operators are controlled only by the general pricing regulations. All the gray market operator has to do is prove that he hasn't raised his prices above what he charged during that base period. For those who printed price lists or kept records, this isn't hard at all. For that matter, why should they want to raise prices? Most of them were already charging all the traffic would bear.

Fewer Curbstone Brokers—In spite of this unexpected legal status the number of curbstone brokers is shrinking; many of them haven't anything to sell. Also there aren't as many complex steel daisy chains stretched across the country because camouflage isn't necessary and there is more danger of a weak link needlessly running afoul of the law.

While there are fewer gray market operators, those remaining are as active as ever. Offerings and tonnage are increasing in heavy consuming areas checked by THE IRON AGE.

The Producer Says—Steel producers think the amount of high-priced steel being offered is much less than 6 months ago. They cite (1) close control on steel shipped, (2) smaller amounts delivered to non-defense customers, and (3) customer commitments to let mills buy back excess tonnage.

The Consumer Says—Steel consumers who have been buying gray market steel to keep their plants going paint a different picture. They say (1) offerings and tonnage have increased during the past month, (2) minimum inventory regulations effective Apr. 1 may add fuel to the fire, (3) foreign steel is a growing factor.

Consumers and producers agree on one noticeable development: alleged connections with top steel company officials have just about vanished.

Uses Half Foreign—Here is an example of how important foreign steel has become to some consumers: A large manufacturer of road building equipment is keeping output high by buying foreign carbon plate and semi-finished steel. Over half their 40,000-ton monthly requirements come from England, Germany, Holland, France and Japan. Their imports range from mild steel to 4550 carbon forging grades. They also get 400 tons of alloy plates monthly from France and 200 from England.

Getting Ready for CMP—This week there are more indications that the government is pulling all the strings together in preparation for a controlled materials plan. Allotment programs are now assigned DO numbers instead of the previous method of certifying. A meeting of the steel task force discussed new programs which will bite deeper into June shipments, further reducing the free market.

Steel Available—in 1957—If you want to book a DO order for electric furnace alloy ingots, one producer will give you a delivery date of June 1957. This producer has just booked a DO order for this product that will take 60 months to deliver. Reason is that production of electric furnace alloy ingots in the base period was very low, hence the DO set aside is low.

See "Can You Make It?"—new Iron Age subcontracting service, on p. 92.

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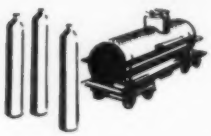

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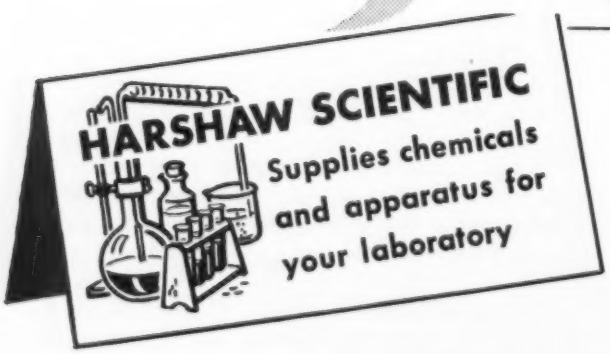
Chemical
Commodities

Glycerine

Fungicides



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A NEW STEP FORWARD... IN AUTOMATIC NUT FORMING...

No. 2 Automatic Nut Former-Capacity ¼" Nuts; Production, 125 per min.

To step-up your nut-producing facilities, look to Waterbury-Farrel's new line of automatic nut formers.

Check these production-boosting design features.

HIGH SPEED—without sacrificing quality. Nut blanks need no subsequent operation except threading.

SIMPLIFIED TOOLING—larger tool holders.

EASY-TO-GET-AT ADJUSTMENTS—save "down" time.

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We're always pioneering . . . we started 100 years ago on March 5, 1851. When we stop pioneering, we stop (period). In this ad you'll find evidence that we're going ahead, into our second century.

In Equipment, Experience Counts . . . We're 100 in '51!

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Dear EDITOR

letters from readers

Who Gets Credit?

Sir:

In THE IRON AGE of Feb. 15 you state in the Assembly Line that more than 3½ million GM cars have been equipped with automatic transmissions, and that the first hydramatic drive was introduced by Oldsmobile in 1939.

Some time ago I had a friendly argument with some friends of mine about automatic transmissions and claimed that the first automatic transmission was introduced by Buick in 1938, and upon investigation found out that this was a fact. In 1938 Buick introduced a four-speed automatic transmission that is the same as the present hydramatic transmission, except that it did not have a fluid coupling. They introduced and sold a few Buick cars in 1938 with this device. The next year, 1939, Oldsmobile as stated in your article introduced the hydramatic drive.

E. W. WILLIAMS
Gerrard Steel Strapping Co.
Seattle

Your statement is correct; several thousand hydramatics were installed on Buicks in 1938 but people generally agree that Olds should be credited with the introduction of the first automatic transmission—without a clutch pedal. The first volume production occurred in 1939.

However, the experimental work preceding the introduction was, we believe, actively led by Olds. The first introduction was also by Olds. It is true that Buick produced the first transmissions for Olds. However, after about a year had elapsed, Buick dropped these units and Olds carried on.—Ed.

Thank You

Sir:

I was much pleased to see your very pleasant write-up on the new Metallurgical Advisory Board in your Mar. 1 issue. We would like to have a copy for our file—would it be possible for you to send me a tear sheet?

R. F. MEHL
Chairman

Metallurgical Advisory Board
National Academy of Sciences
Washington, D. C.

So Big

Sir:

We note that on p. 41 of your Jan. 25th issue you feature Erwin Loewy of Hydropress, Inc., and mention that his latest giant is a forging press bigger than any ever built.

We shall be glad to know if you have published a description of this press or if any has been published elsewhere.

J. G. FIRTH
Davy & United Engineering Co. Ltd.
Sheffield, England

A short description of this new press was published in THE IRON AGE, Jan. 18, 1951, p. 75. No complete technical description of the press has been published for security reasons. However, you may wish to address an inquiry directly to Hydropress Inc., 420 Lexington Ave., New York 17, N. Y.—Ed.

Attention Please!

Sir:

May we call your attention to a misunderstanding that seems to persist in editorial circles regarding the use of a trade-marked product name for a rust preventive which has been and is being used as a generic term?

We refer to Cosmoline, which has been this company's registered trade mark for rust preventives since 1881. Of late this name has been applied by writers and editors to the old-type heavy grease preservatives only, often with an accompanying comment that "cosmoline" is on its way out, being replaced by thin-film protective coatings or vapor-phase inhibitors.

Houghton's series of Cosmoline-branded products include—in addition to the heavy inhibited petrolatum types—a variety of thin film resin-solvent types, polar types, inhibited lubricating oils, waxy film and water-soluble grease types.

The GI's of two world wars will recall with no great pleasure their problems in removing such preservatives, but the fact remains that those products did protect guns safely between wars.

D. J. RICHARDS
Vice-President—Sales
E. F. Houghton & Co.
Philadelphia

Cartoon Wanted

Sir:

In your Sept. 21, 1950 issue there appears on p. 107 a most excellent cartoon by Hank Roesler.

Our committee is presently preparing a very comprehensive report on the use of hydrostatic and hammer tests for pressure vessels, and it has been suggested that this cartoon be made a part of it. May we have your permission to reproduce it for this purpose?

B. E. ROSSI
Executive Secretary
Pressure Vessel Research Committee
Welding Research Council
New York

Going Fast

Sir:

I would appreciate receiving tear sheets of the article "Mid-Century Reference of Heat Treating" by F. R. Morral in your Jan. 4th issue.

R. D. MANNING
Carnegie-Illinois Steel Corp.
Pittsburgh

A limited supply of reprints is still available.—Ed.

will go through this shaft!

This tailshaft turns the screw in a C-2 Cargo Vessel. It's made to take the relentless pounding of a 6000 h.p. power plant for weeks without letup.

To machine it accurately and economically, Moore Dry Dock Co. of Oakland, California needed a powerful precision lathe. That's why they gave the job to a new LeBlond 50″ Heavy Duty Lathe . . . recommended by LeBlond Distributor, Bulotti Machinery Co. of San Francisco. Result? *17 hours off former machining time with a cost saving of 18%.*

This LeBlond Lathe provides fifty horsepower; spindle speeds up to 247 r.p.m.; rigid construction. It makes possible latest turning techniques with carbide tools; gives better finish, closer tolerances and greater economy.

Operators' work is easier, too, because of convenient features—single-lever feed control, exclusive *power rapid traverse* and many more.

Whether you turn ten-ton shafts or ten-ounce bushings, there's a LeBlond Lathe to turn them faster, better. Your nearby LeBlond Distributor will tell you about the 50″ Heavy Duty and other late model lathes. Call him or write—

THE R. K. LEBLOND MACHINE TOOL CO., CINCINNATI 8, OHIO

Ask for Bulletin HD-180 C
for more information on the 50″ Heavy Duty.

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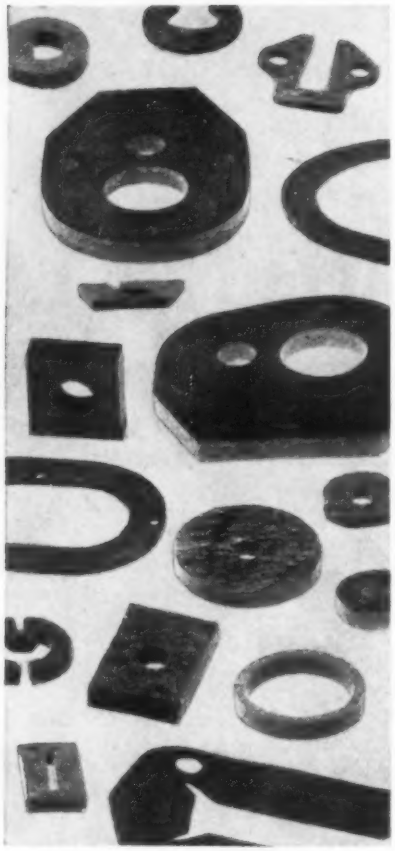

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Chemical specifications must be perfectly met—parts from wool softness to rock hardness are cut to close tolerances. As an extremely versatile material Western Felts are resilient, flexible, compressible. They resist oil, water, heat, age—do not ravel, fray or lose shape. New uses found daily. It pays to depend on Western Felt.

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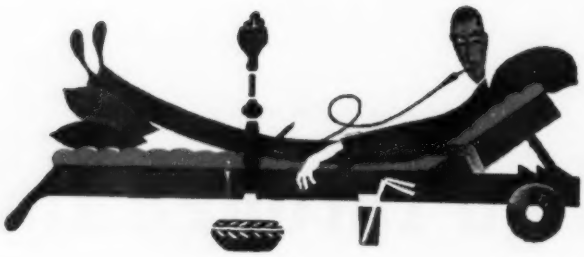


Fatigue Cracks

by Charles T. Post

Impact

Mrs. Nellie Tayloe Ross, director of the mint, does not take her orders from Fatigue Cracks. We want to make this clear in case someone should start a Congressional investigation. In the Mar. 1, 1951, issue we reported associate editor Ted Metaxas' plan to ease the copper shortage: Call in all the pennies in circulation because a penny's no good these days, anyhow.

Mrs. Ross didn't buy the whole plan, to be sure. But last week she proposed that all piggy banks, sugar bowls and bureau drawers be emptied of pennies. Put them into circulation, she urged, so that the mint won't have to mint any more pennies. Industry will have just that much more copper to play with.

We swear to you, Senator, that the mint didn't pay us 10 pct under the table for the idea.

Undercover

Don't think that the Communist countries have been happy since being cut from your favorite family journal's subscription list at State Dept. request. From where we sit, we can detect apparent efforts to get back in by the rear door.

For instance: A New York book dealer attempted to place an order for 29 subscriptions to be shipped to him. When put on the spot, he admitted the copies were to be held for shipment to the eastern zone of Germany. An "engineers' society" in a predominently agricultural western European country suddenly wanted a few dozen identically addressed subscriptions. Some Chinese subscribers, notified that shipment to China was "out," directed that copies be mailed care of a trading company in Hong Kong.

In all cases, of course, the answer was "NO!"

Aptronym

A new bakery has been opened in Los Angeles by Phil Raisin and his brother, Jerry Raisin. Raisin' the question as to whether this is a perhaptronym, Ray Kay wants to know whether the market on raisin bread has been cornered.

Puzzlers

E. J. Sampson, Brockton, Mass., was right with his answers to the contractor problem and the railroad puzzle. Also in on the railroad puzzle were A. T. Hoenke, Pressed Steel Tank Co.; A. T. Wolak, Minooka, Pa., and L. F. Calzi, Philadelphia.

In last week's puzzle Mr. Baker, Sr., and Mr. Carpenter, Jr., whose wife's maiden name was Baker, were butchers. Mr. Taylor, Sr., and Mr. Butcher, Jr.—wife's name was Taylor—were bakers. Miss Carpenter married Mr. Baker, Jr., who is a tailor as is Mr. Carpenter, Sr. That leaves the carpenter trade open to Mr. Butcher, Sr., and Mr. Taylor, Jr. The young Mrs. Taylor was Mr. Butcher's daughter.

To show the seasoned competition you have in working on these puzzles, K. S. Frazier, research department, Detroit Steel Products Co., recalls:

"When I was a farmer lad and we sat down to the evening milking my father would pose a question like this: If a fish had a head 4 in. long and a body as long as his head and tail put together and a tail as long as his head and one-half his body, how long was the fish? It was surprising how choreless the evening chores were!"

When Bessie kicked over the pail, we'll bet he never noticed.

machine tool high spots

sales inquiries and production

by W.A.Lloyd

Nearest Obstacle — Pricing—Three major obstacles, manpower, materials, and the absence of a price ruling, faced the machine tool industry this week as defense program needs began to snowball.

Most immediate of these is the absence of a ruling on prices. Latest rumor is that prices will be rolled back to June 25, 1950. A 10 pct rise over prices then in effect may be allowed if cost increases can be proved.

In Rumor Stage—Industry sources warn this is only a rumor. But if it should become fact, it would be disastrous for the industry.

Some companies are considering the addition of a clause to their quotations giving them the right to cancel the order without liability if they can't build the machine at a reasonable profit, in the event such an order is slapped on the industry.

Rolling machinery prices back to the pre-K-Day level would lop off an estimated 15 pct from most current prices.

Labor Lured Away—Manpower shortages are becoming acute in some areas. The industry is continuing to lose men to other expanding industries. These shortages run directly through the industries that serve mass production: contract tool and die shops, cutting tool manufacturers and allied enterprises.

Skilled workers can practically write their own ticket wage-wise in some of the new plants that need such help.

Works Only in Theory—A quick answer would be a job freeze. The answer that is apparently being awaited is that, as more steel is poured into the defense program, the companies without defense business will lose their people to the defense producers. The flaw here is that non-defense companies thus far have been able to hold nearly all skilled personnel until a defense contract is placed, thus assuring continuity of operations.

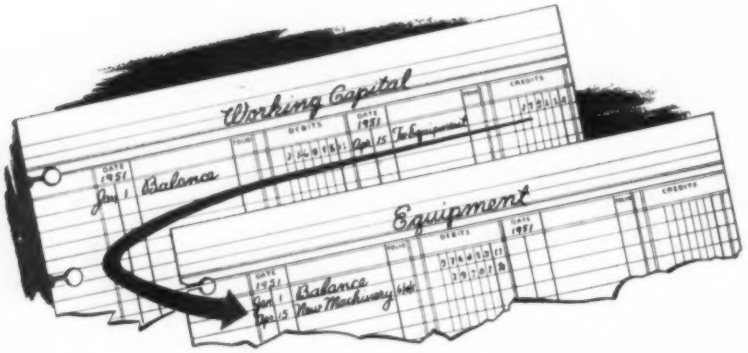
Shortage Holdback — No substantial change has taken place in the industry's overall material problems in the past month. Shipments are still being held down by a variety of shortages, ranging from castings to electrical equipment.

Machines the industry had on its books prior to K-Day have been delayed because of material shortages. What the industry wants now is to get shops cleared before the July 1 deadline, when the scheduling order goes into effect. At the moment, these machines pose a difficult problem.

Order Volume Grows — Pool orders are being placed and a growing number of such placements is expected within the next month. New order volume shows no sign of leveling off. Reports on February order volume indicate that the preliminary index of new orders will be possibly 540, compared with 478 for January; index of 125 for shipments compared with 113 in January, and a material increase in the ratio of unfilled oders to shipments.

Certificates Make Debut—Delay in issuing certificates of necessity to machine tool companies seems to be over. According to reports, at least three companies have received certificates permitting 85 pct write-off of their contemplated facilities during the next 5 years. Reason given for not issuing a "100 pct" certificate is that the facilities will be of some post-defense program value.

In Buffalo, Weisner-Rapp, Inc., has received government orders for about $800,000 to make milling machines for the production of military aircraft. Weisner-Rapp, Inc., produced a large number of special machines for the aircraft industry in World War II.



STOP losing working capital . . .

when purchasing income-producing equipment

Whether your problem involves the purchase of a single piece of equipment or the complete installation of modern machinery in your plant, you can obtain the immediate use and benefit of the needed machines and facilities without losing any of the working capital of your business,—without draining the funds needed to carry inventory and receivables.

Financing these purchases through the Equipment Finance Department of The Philadelphia National Bank will enable you to buy income-producing machinery and often pay for it out of the profits realized through the operations of the machines themselves.

Regardless of the size of your business, you will find our long experience in financing manufacturers, distributors and operators an invaluable help in solving your equipment financing problems. We cordially invite you to discuss your situation with us.

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in more ways than one

THE PHILADELPHIA NATIONAL BANK

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DATES *to remember*

Apr. 2-3—Diamond Core Drill Manufacturers Assn., annual meeting, The Homestead Hot Springs, Va. Association headquarters are at 122 E. 42nd St., New York.

Apr. 2-4—American Institute of Mining & Metallurgical Engineers, openhearth and blast furnace, coke oven and raw materials conference. Statler Hotel, Cleveland. Institute headquarters are at 29 W. 39th St., New York.

Apr. 2-4—American Gas Assn., national sales conference. The Shoreham Hotel, Washington. Association headquarters are at 420 Lexington Ave., New York.

Apr. 2-5—American Society of Mechanical Engineers, spring meeting, Atlanta Biltmore Hotel, Atlanta. Society headquarters are at 29 W. 39th St., New York.

Apr. 2-7—Steel shipping Container Institute, annual meeting, Palm Beach-Biltmore Hotel, Palm Beach, Fla. Institute headquarters are at 570 Lexington Ave., New York.

Apr. 4-6 — Midwest power conference, Sherman hotel, Chicago. Conference director Dr. R. A. Budenholzer, Illinois Institute of Technology.

Apr. 5-6—Compressed Air & Gas Institute, quarterly meeting, The Homestead, Hot Springs, Va. Institute headquarters are at 122 E. 42nd St., New York.

Apr. 8-11—Electrochemical Society, spring meeting, Wardman Park Hotel, Washington. Society headquarters are at 235 W. 102nd St., New York.

Apr. 8-12—American Hardware Manufacturers Assn., annual convention, Palm Beach, Fla. Association headquarters are at 342 Madison Ave., New York.

Apr. 9-10—American Institute of Steel Construction, spring engineering conference, Hotel William Penn, Pittsburgh. Institute headquarters are at 101 Park Ave., New York.

Apr. 15-18—Scientific Apparatus Makers Assn., annual meeting, Greenbrier, White Sulphur Springs, W. Va. Association headquarters are at 20 N. Wacker Drive, Chicago.

Apr. 16-18—American Gas Assn., distribution, motor vehicle and corrosion conference, Hotel Peabody, Memphis, Tenn. Association headquarters are at 420 Lexington Ave., New York.

Apr. 16-18—American Society of Lubrication Engineers, annual convention and lubrication show, Bellevue-Stratford Hotel, Philadelphia. Society headquarters are at 343 S. Dearborn St., Chicago

Apr. 16-18—Gas Appliance Manufacturers Assn., annual meeting, Drake Hotel, Chicago. Association headquarters are at 60 E. 42nd St., New York.

Apr. 16-18—Society of Automotive Engineers, aeronautic meeting and aircraft engineering display, Hotel Statler, New York. Society headquarters are at 29 W. 39th St., New York.

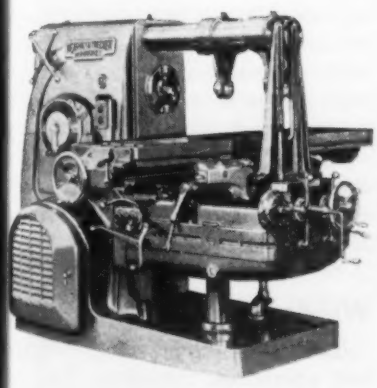
Apr. 16-21—Concrete Reinforcing Steel Institute, annual meeting, The Homestead, Hot springs, Va. Institute headquarters are at 38 S. Dearborn St., Chicago.

GREATER CUTTING EFFICIENCY

Here's the "business end" of a new CK milling machine — the spindle — with its new dynamically balanced flywheel and Kearney & Trecker's famous, original, extra-rigid, three-bearing spindle design. Added flywheel momentum gives you smoother, more positive cutter drive — the key to Greater Cutting Efficiency using modern cutting tools. And you get increased cutter life, too. The three-bearing spindle design affords ample support and greater rigidity. The heavy duty wide-faced spindle drive gears of forged steel are specially processed for longer life and exceptionally smooth, quiet operation.

A new line of knee-type milling machines

KEARNEY & TRECKER MILWAUKEE **CK's**



New Model CK
25 hp No. 5 Plain Style
Milling Machine

YES, Kearney & Trecker's new CK milling machines are packed with design and operating features that make them *more productive, more profitable for you.*

Spindle-mounted flywheel, broad feed and speed ranges and greater horsepower with separate motor drives for spindle, and feed and rapid traverse, mean you get fullest possible benefit from modern cutting tools.

New CK columns give you greater rigidity. Compared to former columns, they give you 1000 pounds more metal in heavier ribbing, in box-type, sponson construction to absorb vibration from heaviest cutting loads.

For greater production, these machines are equipped with Kearney & Trecker's famous Mono-Level Control that shortens floor-to-floor time, and materially reduces operator fatigue. New, non-glare micrometer dials help avoid costly errors in reading . . . give you a positive lock at every setting.

Automatic flood lubrication in column and knee and positive metered lubrication to table and saddle, plus generously proportioned gears and shafts assure you greater machine life.

Find out for yourself about Kearney & Trecker's new CK line of knee type milling machines . . . how they meet every demand of modern milling practice . . . how they can give you greater production at greater profit.

Sizes are No. 2, 3, 4, 5, and 6 . . . Plain and Universal styles. For complete details, contact your nearest representative or write direct. Kearney & Trecker Corp., 6784 W. National Ave., Milwaukee 14, Wisconsin.

REPLACEMENT OF OBSOLETE MACHINE TOOLS
IS AN INVESTMENT THAT MAKES BOTH DOLLARS AND SENSE

KEARNEY & TRECKER MILWAUKEE MACHINE TOOLS

FREE *publications*

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just fill in and mail the postcard on the opposite page.

Metal Cleaner

Houghto-Clean 313-A, a special acid phosphate cleaner developed expressly for the preparation of metal surfaces for painting, lacquering or japanning, is described in a new data sheet telling how this product conditions metal for final finishing by removing soil, then depositing a smooth, dry coating of phosphate on the metal surface to provide greater adhesion of the finishing material. Advantages and method of application are detailed. *E. F. Houghton & Co.*

For free copy insert No. 1 on postcard.

Magnesium Dockboards

Magcoa lightweight magnesium dockboards, one-quarter the weight of steel of comparable size and strength and designed like a bridge for structural dependability, are described in a new 4-p. folder listing other important advantages. The bulletin shows a number of varied uses, and also gives details on a combination ramp-dockboard for use where materials handling equipment with low under clearance is used and truck or freight cars are much higher than the dock. *Magnesium Corp. of America.*

For free copy insert No. 2 on postcard.

Piloted Couplings

How Falk piloted Steelflex couplings carry the weight of extended shafts with no intermediate bearing support is diagrammed and explained in a new 6-p. folder listing construction features and showing details of the grid groove design. Dimensional drawings and other specifications are shown, and typical applications are illustrated. Advantages of a floating shaft assembly are described. *Falk Corp.*

For free copy insert No. 3 on postcard.

Space Heating Bulletin

Dravo Counterflo direct-fired space heaters, in a range of gas- or oil-fired models with outputs from 400,000 to 2 million Btu per hr, are described in a new 8-p. bulletin. A comparison chart shows that steel needed for installation is, in most cases, reduced 50 to 70 pct through the use of direct-fired warm air heaters. *Heating Dept., Dravo Corp.*

For free copy insert No. 4 on postcard.

Overseas Foundry

The extensive facilities of FHL for the manufacture of carbon and alloy steel castings in small or large quantities, from a few pounds up to 25 tons in weight, are described in a 52-p. illustrated booklet listing properties and applications of a selection of this British company's cast steels. Numerous examples of both small and very heavy castings are shown, as well as some of the unusual jobs that were handled. *F. H. Lloyd & Co., Ltd.*

For free copy insert No. 5 on postcard.

All-Purpose Trolley

Electric Feedrail, a modern all-purpose trolley busway system of electrical distribution offering safety, convenience and adaptability, is detailed in a new 62-p. booklet telling what it is and what it does. Features and advantages, range and scope of application, and general specifications for track sections and accessories are all covered, as well as information on mounting methods and numerous illustrations of typical installations. Data is also given on planning systems and layouts. *Feedrail Corp.*

For free copy insert No. 6 on postcard.

Materials Handling

The first and succeeding issues of the quarterly "Industrial Handling" are dedicated to the purpose of promoting a better understanding of the science of bulk material handling, and is intended to teach ways and means of simplifying the handling of loose materials in their many and various forms, shapes, weights and sizes. Vol. 1 No. 1 contains several stories on use of Payloader equipment to correct costly manufacturing deficiencies. *Frank G. Hough Co.*

For free copy insert No. 7 on postcard.

Corrosion Computer

Operating simply, like a slide rule, a handy new pocket-sized computer quickly and accurately tells the proper non-ferrous or stainless steel alloys to use for 142 corrosive situations. The inner member is moved to line up the corrosive agent with a large arrow. A window then rates 13 non-ferrous and stainless steel alloys as excellent, good, fair or not good for this agent. The computer is intended for executives, engineers, metallurgists, and others interested in fastenings. *H. M. Harper Co.*

For free copy insert No. 8 on postcard.

Welded Steel Pipe

Tables of dimensions, weights, test pressures, threading data and bundling schedules for Spang CW black and galvanized steel pipe are given in a new 32-p. bulletin emphasizing modern fabrication methods, constant development, and application of closer controls on the mechanized fabricating processes as the means of producing pipe with qualities beyond standard

Turn to Page 104

NEW *production ideas*

new and improved production ideas, equipment, services and methods described here offer production economies . . . fill in and mail postcard.

Burr Resharpening Service

Savings realized; aids in tungsten and cobalt conservation program.

A service for resharpening dull burrs is available to users of P&W Kellerflex carbide and high speed steel burrs, and also to users of competitive manufacture. Burrs returned for sharpening are first inspected for shank runout. Bent shanks are removed and either straightened or replaced. Special machines are used that grind precisely under the control of extremely accurate master forms, removing a bare minimum of stock. The process insures complete shank concentricity plus uniformity of flute spacing and angles. *Pratt & Whitney, Div. Niles-Bement-Pond Co.*

For more data insert No. 20 on postcard.

Air Filter Washer-Oiler

Saves time and labor in cleaning filters in air conditioning systems.

A Safe-N-Ezy washer-oiler works on the principle of centrifugal force. Filters spin in the interior basket of the machine at a relatively high speed during the complete cleaning and oiling cycle so that they are thoroughly washed, rinsed, spun dry and oiled all in one continuous operation. One man working at a normal rate can clean 600 or more 19½x10½x2⅛ in. air filters in an 8-hr day, it is reported. *Paxton-Mitchell Co.*

For more data insert No. 21 on postcard.

Cylinder Mounting

Saves time, labor, space, and cost of making actual pipe connections.

Quick, easy installation of air and hydraulic cylinders singly or in side-by-side, manifold mounting is possible with new O-ring cylinder mounting. The air or hydraulic piping is directly connected to ports in a machined flat surfaced mounting plate or manifold and the cylinders are mounted on this plate with their ports mating in perfect alignment with the mounting plate ports. O-ring seals at the mating surfaces of the cylinder ports assure a leakproof seal under pressure and suction and conform to JIC hydraulic standards. The O-ring seal is preassembled into the port of the cylinder thus eliminating installing the O-ring assembly separately. *Miller Motor Co.*

For more data insert No. 22 on postcard.

Cam Action Dogs

Concealed spring holds cam to work; harder the drive, tighter the grip.

Increased production and efficiency by saving time and labor, particularly on semi-automatics and where there is little traverse feed, are claimed for a new cam action grinder and lathe dog. The dogs are easy to adjust, with instant, positive action. For grinders the cam face is accurately ground smooth, both surface and contour, protect-

use postcard below

Postcard valid for eight weeks only. Information may be secured subsequently by separate letters fully describing each item wanted, including company name.

FIRST CLASS
PERMIT No. 36
(Sec. 34.9 P.L.&R.)
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NEW YORK 17, N. Y.

production ideas

Continued

ing work from mars, thus eliminating spoilage and rejects. For lathes, the cam face is serrated to prevent slipping. Construction is steel with specially hardened cam face and set screws. Dogs have brass cam and screws for use on grinding machines. Sizes accommodate ⅛ to 6 in. diam. *Ready Tool Co.*

For more data insert No. 23 on postcard.

Industrial Caster

Accommodates 8½ in. heavy duty Aerol wheels; 2000-lb load rating.

The new heavy duty unit is cast from aluminum alloy and is designed to minimize clutch wear, battery strain, and mechanical fatigue on power towing equipment. Maintenance problems are simplified through the use of a permanently adjusted king pin of 1¼ in. chrome molybdenum steel. Special lubricants are sealed in the hub and caster rig at the factory. In aeronautical applications, the caster is said to withstand impact thrust loads of 40,000 to 60,000 lb. *Aerol Co., Inc.*

For more data insert No. 24 on postcard.

Welding Electrode

Heavily coated, features time-saving penetration, solid fusion.

In making a weld, a new welding electrode, the DH-4, leaves a negligible deposit of the weld metal so that the fusion consists mainly of the parent metal. This is said to give the weld a stronger, more uniform character. Applications of this ac and dc electrode include: quick, inexpensive welding of extremely heavy sections; fast, easy making of horizontal fillet welds; getting best results on a vertical down weld; gouging removal of cracked and faulty welds; safe cutting of stainless, mild steel, manganese, bronze aluminum and cast iron. The electrode is produced in three sizes: ⅛ in. for use at 300 amp, 5/32 in. for use at 400 amp, and 3/16 in. for use at 450 to 500 amp. *Harnischfeger Corp.*

For more data insert No. 25 on postcard.

Metal Stripping Service

Customer's samples processed free and quotations given promptly.

A new stripping process for removing metal coatings is stated to strip chromium, nickel and copper from zinc-base alloys, aluminum, copper, brass and steel without etching or pitting of the base metal. Zinc diecastings are stripped cleanly so that they can be rebuffed to a high luster by means of only a wheel wipe. The process is not for sale. *Stratford Co.*

For more data insert No. 26 on postcard.

Multipoint Capacilog

Strip chart recorder provides up to 6 permanent records on 1 chart.

The electronically operated Multipoint Capacilog is a deflection type strip chart recorder. Measurement may be obtained with sensing units producing electric signals, such as thermocouples, radiation detectors, etc. This deflection type system is a direct reading, non-balancing method of detecting changes in a measured variable. *Wheelco Instruments Co.*

For more data insert No. 27 on postcard.

Granite Surface Plate

Claimed accuracy of 0.000050 in.

A new precision surface plate made of black granite is claimed to be harder than tool steel. It is non-magnetic, non-deflecting, nonglaring, and requires no oiling. Known as the Micro-Flat, this black granite plate provides bench workers engaged in tool and die making, inspection, and precision instrument assembly to lay out work on an incredibly smooth surface that is non-erosive. The Micro-Flat is available in sizes from 9x12 in. to 54 x 108 in. *Collins Granite Surface Plate Co.*

For more data insert No. 28 on postcard.

Transfer Machine

The 66-ft, 15-station machine processes 77 cylinder heads per hr.

The transfer machine completes 251 operations on the top, bottom, manifold side, and ends of automobile cylinder heads. The operations are said to be completed in a cycle time of 37.2 sec. Turnover fixtures

use postcard below

Postcard valid for eight weeks only. Information may be secured subsequently by separate letters fully describing each item wanted, including company name.

Name ..... Title ..... Company ..... Co. Address .... THE IRON AGE, New York 17	3/22/51 ☐ Fill in above the number of the item on which you need further data.
Name ..... Title ..... Company ..... Co. Address .... THE IRON AGE, New York 17	3/22/51 ☐ Fill in above the number of the item on which you need further data.
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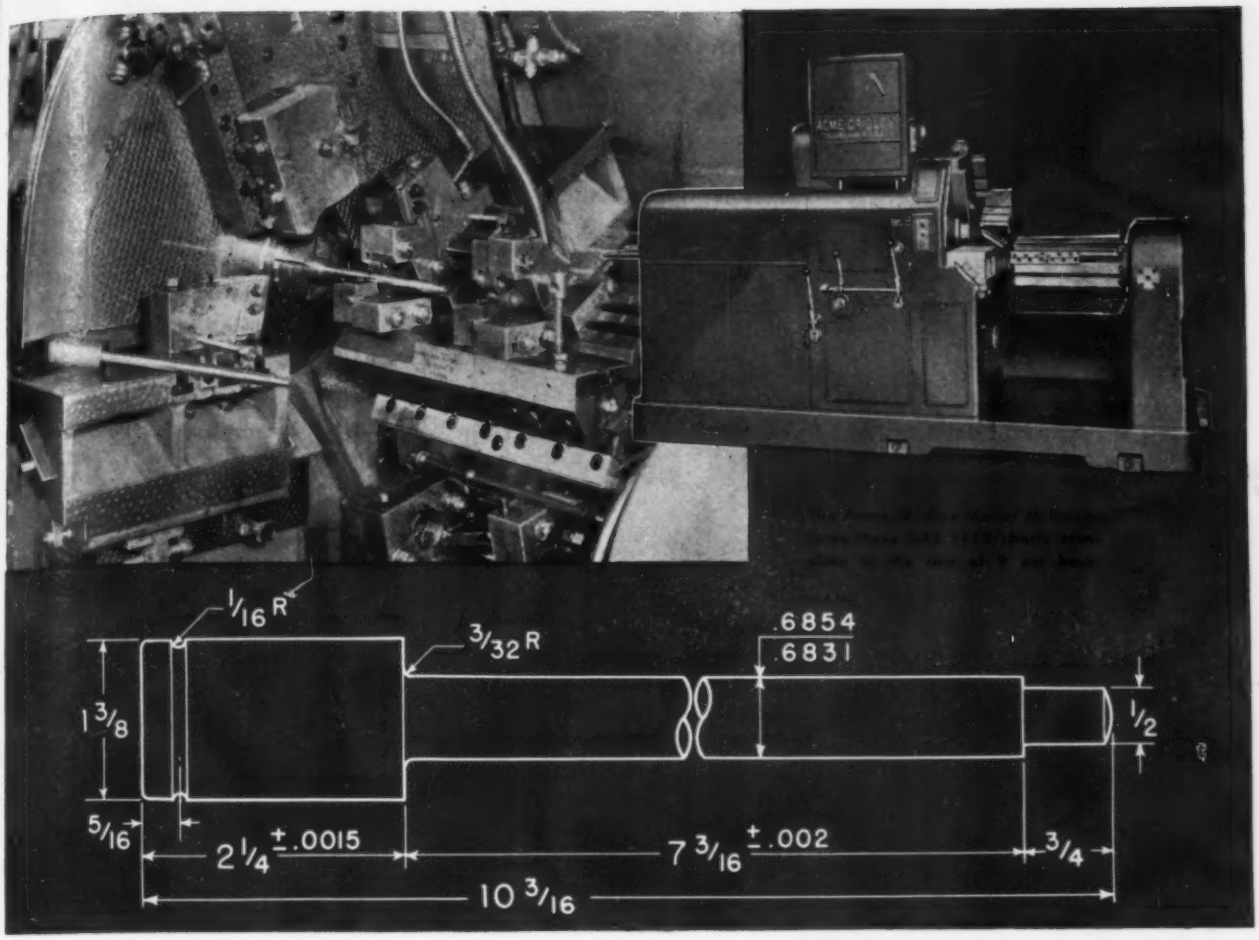


THREE TIMES FASTER

—with fine finish and close tolerances

ALL ON AN ACME-GRIDLEY MODEL M AUTOMATIC

Turning long diameters to close tolerances can be tricky—but the new Acme-Gridley Single Spindle Model M Automatic takes exacting jobs like this in stride.

Its wide, open tooling zone and rugged frame are ideal for the special tooling such work requires. In the case-study illustrated, for example, there's plenty of room for the special independent accelerated drive used to get fine finish, and for the roller supports that help preserve close tolerance. Frame strength adequate for high-speed or carbide tools contributes to production records like this three-times-faster performance of nine shafts per hour.

There are other production-increasing advantages, too: eight independently operated tool slides and three ranges of automatic spindle speeds permit the use of the best speeds and feeds for each cut.

Ask for production estimates on your jobs.

Acme-Gridley Model M Automatics are built in three capacities: 3½", 4½" and 5½". For complete information ask for Bulletin M-50.

Machine obsolescence is the creeping paralysis that strangles profits.

The NATIONAL ACME CO.

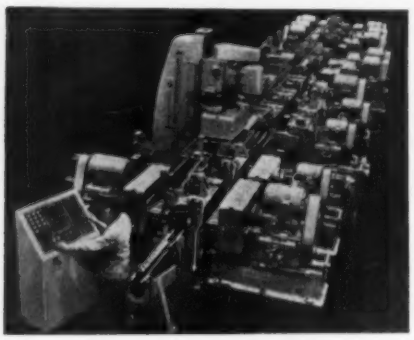
170 EAST 131st STREET · CLEVELAND 8, OHIO

Acme-Gridley Bar and Chucking Automatics: 1-4-6 and 8 Spindle • Hydraulic Thread Rolling Machines • Automatic Threading Dies and Taps • The Chronolog-Limit, Motor Starter and Control Station Switches • Solenoids Centrifuges • Contract Manufacturing

production ideas

Continued

that rotate the work 360° are installed in the fourth and seventh stations to remove the chips that accumulate within the workpiece during the machining operations. The same stations also serve as inspection stations. The right-hand unit in the sixth station contains two heads that move in and then cross-feed to perform two drilling and countersinking operations on the



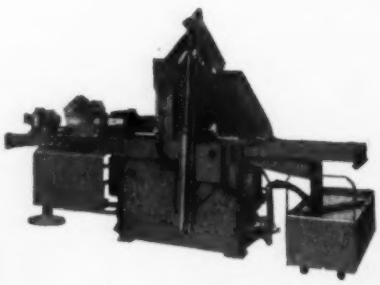
back end of the work, and a boring and chamfering operation on the front end. The right-hand unit in the fifth station is a milling unit containing a retractable spindle for milling a pad on the back end of the work. This machine also semi-finish-reams and finish-reams the 16 valve guide holes. *Greenlee Bros. & Co.*

For more data insert No. 29 on postcard, p. 35.

Cutting Machine

Cuts round solid bars to 8 in. diam, tubing to 8 in. OD; ferrous, nonferrous.

A new wet abrasive cutting machine, Model 508, is a revolving work bar type machine with oscil-



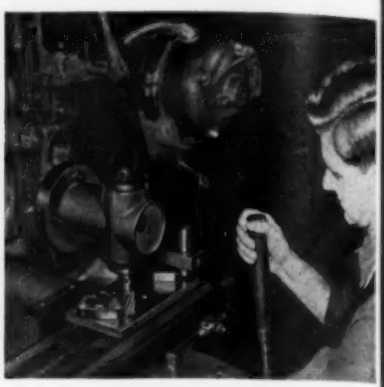
lating abrasive cutting wheel, hydraulic wheel feed and hydraulic work clamps. It cuts ferrous, nonferrous or plastic materials, including corrosion resisting and hardened or annealed steel. Temperature is controlled by proper distribution of coolant. The machine is said to cut all solids or tubing with a minimum of burr. *Campbell Machine Div., American Chain & Cable Co., Inc.*

For more data insert No. 30 on postcard, p. 35.

Milling Attachment

Converts Nichols horizontal millers for vertical milling operations.

The vertical attachment is designed to take full 1 hp drive, with maximum speeds up to 2000 rpm. It consists of a heavy one-piece casting that houses the entire mechanism and alignment pads on the body casting allow for easy mounting in a true vertical plane. Drive shaft and vertical spindle are ball-bearing mounted. The spindle is hardened and ground with maximum allowable runout held within 0.00015 in. full indicator reading. The vertical spindle nose is identical with the horizontal spindle nose,



bored No. 40 National Standard taper, and will interchange all tooling. The vertical attachment is mounted in a circular T-slotted adapter plate, that encompasses the horizontal spindle nose. It swivels around the horizontal spindle if desired, with suitable graduations in degrees provided. The attachment is driven through a splined adapter in the mouth of the horizontal spindle. *W. H. Nichols Co.*

For more data insert No. 31 on postcard, p. 1

Utility Mill

Provides efficient close-tolerance machining in aircraft production.

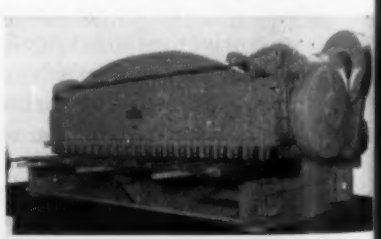
Designed as a precision milling machine for use in aircraft production, the Utility Mill provides close-tolerance machining of extrusions, sections and billets of aluminum or other nonferrous metals. The machine is simply and cheaply tooled, and adaptable to many types of cuts. Heavy duty 15 hp spindles and carriage feed speeds of 24 to 190 ipm provide maximum removal of metal per minute. Each of the two spindles is arranged for individual horizontal hydraulic template control and is furnished with the Farnham template control for vertical motion. Both heads may be template actuated vertically and horizontally from four individual templates at the same time. Each spindle has manual adjustment for horizontal and vertical movement and swivel adjustment of 15° each side of vertical center. Length of bed is 60 ft with max work length, 55 ft. Longer or shorter beds can be furnished. *Farnham Mfg. Div., Wiesner-Rapp Co., Inc.*

For more data insert No. 32 on postcard, p. 35.

Squaring Shear

Capacity, 20 ft of ½ in. mild steel plate; speed, 20 strokes per min.

The shear weighing over 135,000 lb is equipped with hydraulic hold-



downs capable of exerting a holding force of 70 tons. The hold-downs pistons are made with automobile type piston rings for long life and have a vacuum pump arrangement that prevents leakage of hydraulic oil. The shear has a 24-in. throat

Turn to Page 108

IRON AGE *salutes*

Robert Schenck

ROBERT "BOB" SCHENCK, Buick's quiet, soft-spoken, chief metallurgist, has a knack for spotting metallurgical trends years in advance.

Back in 1938 Bob had a hunch about boron steels and tenaciously backed that hunch with tests on boron-treated axle shafts. He modestly credits many others with an active part in developing boron steels, but this big, friendly man probably tested more boron-treated steels before World War II than anyone else.

At first few metallurgists shared his belief, but the results of those tests justified his faith. His findings brought him responsibility for supervision of National Research Council projects during World War II. Between 1942 and 1944 Mr. Schenck and his staff at Flint studied boron-treated homogeneous and carburized plate and armor piercing shot, as well as new ways of making armor plate.

Under his supervision Buick adopted high-manganese steels for axle shafts. He was the first automan to order a controlled atmosphere furnace for gears. In World War II he helped develop NE steels, and 75 mm steel cartridge cases which freed copper for other uses.

When Bob Schenck retires next summer after 35 eventful years at Buick he will carry with him the gratitude and admiration of automotive metallurgists. His warmth and fairness have won him wide respect in the industry.

Bob's reputation as a host is the envy of neighbors at his Lake Fenton home near Flint. Chances are he will spend much time among the friendly people and in the congenial surroundings he has always liked so well.

J. A. HUGHES, elected a vice-president of Affiliated Gas Equipment, Inc., Cleveland, and general manager of the Bryant Heater Division.

L. F. REINARTZ, elected vice-president in charge of special operating development for Armco Steel Corp., Middletown, Ohio.

C. S. IMMIG, appointed director of purchases by the Hydraulic Press Mfg. Co., Mount Gilead, Ohio.

L. F. McCAFFREY, joined Empire Steel Corp., Mansfield, Ohio, as assistant general superintendent.

IRON AGE *introduces*

Continued

John H. Scott, named assistant chief chemist of LUKENS STEEL CO., Coatesville, Pa. Mr. Scott had been in charge of spectroscopic analysis in the chemical laboratory of the company.

Joseph H. Matulis, named industrial manager, Chicago branch by MINNEAPOLIS - H O N E Y W E L L REGULATOR CO. Others named: **Willard Smith,** Pittsburgh branch; and **Joseph H. Bowman** at the Buffalo office.

Robert M. Buck, appointed as manager, industrial division of BRYANT HEATER DIVISION, Affiliated Gas Equipment, Inc., Cleveland.

Ermand L. Watelet, appointed director of design of precision tools and gages by the BROWN & SHARPE MFG. CO., Providence.

G. D. Tranter, named manager of the Middletown division; **D. S. Holstein,** general superintendent in charge of rolling and processing; and **O. E. Clark,** general superintendent in charge of blast furnaces and melting at that division, for ARMCO STEEL CORP.

M. A. Moore, promoted as Eastern division manufacturing and sales manager of the DOUBLE SEAL RING CO., Fort Worth, Tex.

L. T. Callahan, named manager of operations of the aircraft gas turbine divisions at Lynn and Everett, Mass., of the GENERAL ELECTRIC CO. **W. G. Arnold,** appointed manager of manufacturing of the company's welding department.

Charles S. Wiggins, appointed assistant manager, Washington office of BORG-WARNER CORP.

Walter Bertram, named in charge of the Cleveland office for ASSOCIATED SPRING CORP., Bristol, Conn.

F. C. Winter, named as manager of defense procurement for WORTHINGTON PUMP & MACHINERY CORP., dividing his time between Harrison, N. J. and the company's Washington office. **C. W. Camp,** named assistant corporation manager of defense procurement.

Raymond T. Whitzel, named assistant manager, reduction division, of ALUMINUM CO. OF AMERICA, Pittsburgh. **Wiser Brown,** named chief industrial engineer. Mr. Brown was formerly in charge of magnesium fabricating activities.

J. E. Nordheim, appointed superintendent of the sheet mill at the Park Works of CRUCIBLE STEEL CO. OF AMERICA, Pittsburgh.

John F. Tyler, named assistant sales manager of the building products division of the AMERICAN WELDING & MFG. CO., Warren, Ohio.

Robert E. Gilmore, appointed assistant factory manager of CATERPILLAR TRACTOR CO., Peoria, Ill. Mr. Gilmore will coordinate the scheduling and building of industrial engines.

Howard E. Pellett, joined the LINDBERG STEEL TREATING CO., Chicago, as sales engineer in the Los Angeles plant. **Robert T. Sinnott,** appointed to the metallurgical department and **Robert J. Funkey** is now employed in the electrical department.

Carl W. Meyers, elected president of the newly named CLAYMONT STEEL CORP., Claymont, Del., and **Charles Allen, Jr.,** was named chairman of the new steel corporation.

OBITUARIES

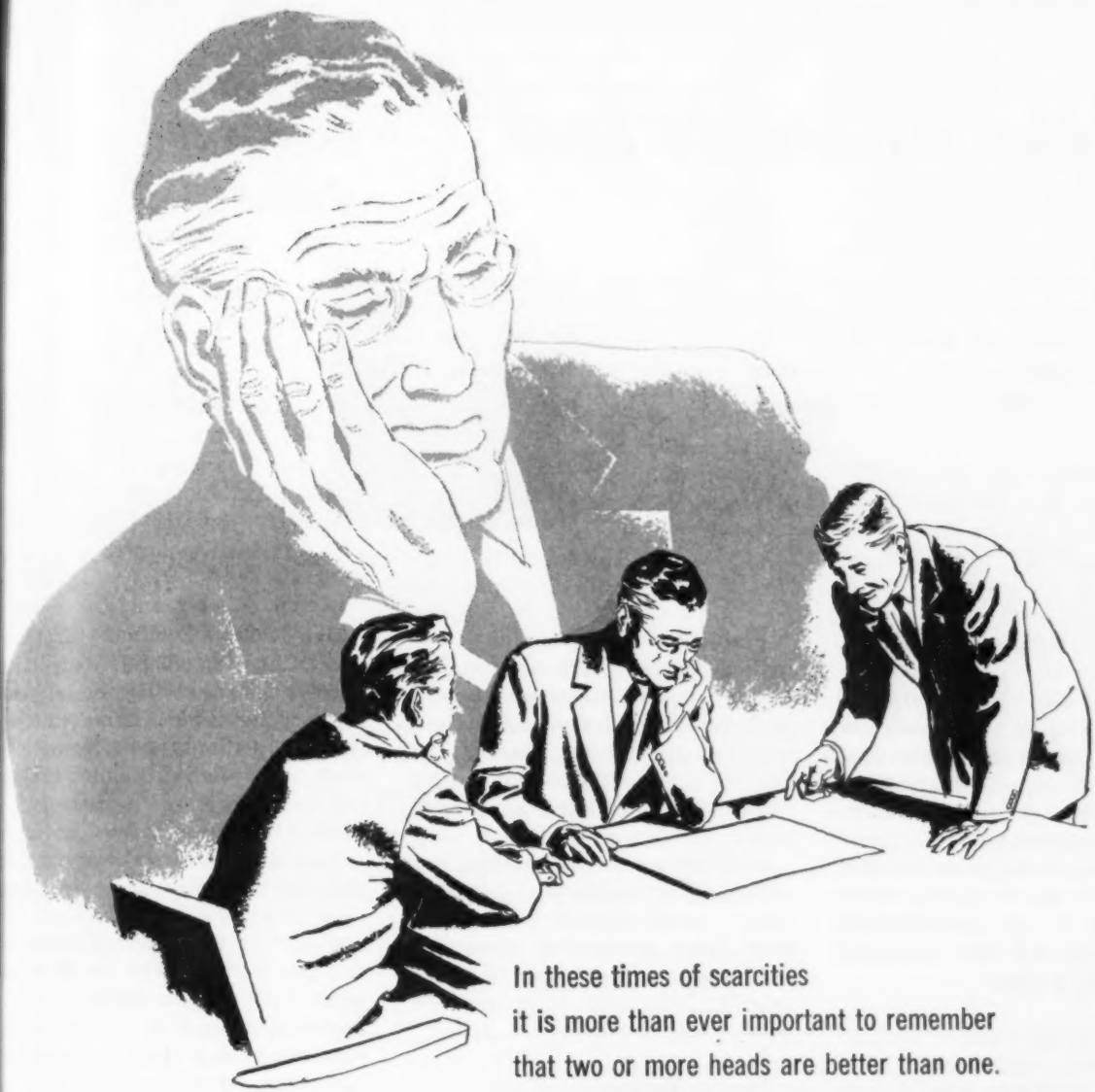
Charles Lukens Huston, Sr., 94, pioneer steel maker and first vice-president of the Lukens Steel Co., Coatesville, Pa., died March 14, 1951.

Quincy Monroe Crater, 48, marine, aviation, and transportation sales manager for the central division of Westinghouse Electric Corp., died at Pittsburgh recently.

Frank B. Hastings, chief inspector for Aluminum Co. of America's Pittsburgh architectural sales division, died recently at Daytona Beach, Fla.

Col. Oliver Roland Hood, 83, one of the founders of Alabama Power Co. in 1906, died recently in Gadsden, Ala.

James W. Moore, a member of the board of directors and an executive of the American Cast Iron Pipe Co. in charge of the company's special products division died at his home in Birmingham recently.



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on the assembly line

automotive news and opinions

Alloy steel cut poses threat to auto output . . . New '52 dies may go into mothballs . . . GM Super-Jet

by Walter G. Patton

Alloy Steel Drop—Reduced steel deliveries to Detroit during May could set off a fast deceleration in automobile output, many observers here believe. The most critical steel item will be alloy bars. After allowance for warehouse allotments and deliveries to cold drawers, alloy steel shipments to Detroit may be off 61 pct or more during May. Carbon bar deliveries may be off 40 pct in May compared with the base average.

Trucks Better Off — Despite scheduled cutbacks in carbon bars, automobile producers should have considerable room in which to maneuver. There are no steel restrictions at this time on truck production or service parts output. Accessory production is limited, however. It is possible, therefore, that while passenger car output may be cut 20 pct, a smaller reduction in truck output is likely—if the producer can get the steel.

Cutback Time Lag—Curtailed bar shipments in May may not actually be felt in auto plants until 30 to 60 days later. Auto output is roaring along almost 20 pct ahead of last year's first quarter when Chrysler was strikebound. March output is estimated at more than 700,000 cars and trucks, bringing the aggregate for the period to 1,950,000. So far this year, weekly average output is more than 150,000 units.

Predictions Stand—Many Detroit executives have been anticipating production would be off perhaps 20 pct during the second quarter and 30 pct during the third quarter. A 20 pct cut during the second quarter still appears to be an accurate projection.

A 30 pct cut or more during the third quarter seems probable—despite reports out of Washington that arms production plans for 1950 are being cut down from the original goals because of delays in getting into production.

Dies in Mothballs—Reports persist here that 1952 dies now being completed in tool and die shops will be "put on ice" for the duration. Fisher Body, it is reported, was originally scheduled to go into production of certain new parts for 1952 models during July. According to available information, the present models will be continued.

Decisions have not been made, but indications point strongly to an indefinite delay in introducing most 1952 models involving extensive body changes. This includes the Big Three. Price control, materials shortages and the promised cutbacks in production all point to a continuation of the present models. Die work is still going on; there have been no cancellations. There will be new car models all right—but nobody knows for sure when they will be introduced.

Gas Turbine Coming?—A prominent Chrysler official is reported to have said that the present new high compression engine will be the last piston-type reciprocating engine Chrysler will build. This is not too surprising since the minimum life expected from an auto engine is 10 years. Some of the engines in service today are more than 15 years old.

Many Detroit engineers expect the gas turbine will be off to a good start before 1961. A great deal will depend on future developments with respect to fuel consumption, throttle control, turbine cooling and overall cost.

Bigger Role for Metals—The opinion is developing that both aluminum and magnesium are destined to play a much bigger part in the automobile of the future. These are the only two metals today with highly promising prospects for increased availability. Meanwhile, steel production increases must wait on ore and scrap developments whose immediate future is not too comforting.

Aluminum at 16¢ per lb has already cut deeply into the market for some copper products. Wire for high tension electricity lines is an example. One plant may use up to 3 million lb of aluminum for bus bars.

Side by Side—An advance blueprint of defense production is to be found in the current conversion

assembly line

Continued

program at Kaiser-Frazer's giant Willow Run plant. Mass manufacture of C-119 Fairchild cargo planes will go on side-by-side with scheduled auto production of 900 cars daily.

About a million sq ft of the Willow Run plant will eventually be used for aircraft. Major changes in the auto production facilities include removal of the huge inside railway shipping dock, relocation of machine shops, rerouting of spray paint lines and construction of new body trim lines. No changes in the final assembly lines will be required. K-F already has 20 carloads of machine tools and other aircraft production equipment.

Olds' Official Debut—Although the Super 88 1951 Oldsmobile was exhibited at the Chicago Show recently, official introduction occurred only last week. The new model is readily identified by a distinctive decorative sash, extending from the shoulder of the rear fender diagonally down the fender to the gravel shield. There will be five deluxe body styles.

Improved all-around vision, new leaf-type rear springs, improved foam rubber seat cushions and new fender lines are featured. Compression ratio of the 135 hp "Rocket" engine has been increased to 7.5 to 1. The redesigned combustion chamber permits the use of standard fuel but Olds engineers recommend premium fuels for best performance.

Raps Auto Taxes—A. E. Barit, chairman, Taxation Committee, Automobile Manufacturers Assn., charged that the proposed government taxation on motor vehicles is highly discriminatory. The statement was made in an appearance before the House Ways and Means Committee last week.

The AMA arguments: (1) special motor vehicle taxes during 1950 aggregated $4,480,000,000; (2) the motor vehicle and parts industry is already paying 16.5 pct of all federal corporate income tax; (3) 55 pct of all car mileage is for necessities; (4) 59 pct of car trips are for the purpose of making a living; (5) 2074 cities over 1000 population have no mass transportation system; (6) taxes take 24¢ out of every automobile dollar; (7) cars are much older on an average today than they were in 1941.

Car of Future—Brooks Stevens Associates, Milwaukee car designers, have developed the "Excalibur" as the car of the future—possibly 1960. Features include 180 degree vision (made possible by moving the corner pillar back from the windshield), depressed fenders, a long, tapered-down bonnet, jet-like nostrils in the fenders to receive sealed-beam headlights, and complete elimination of the conventional front grille.

Ford Tank Contract—With the signing of a letter order to produce medium tanks in a plant to be built in the Detroit area, total volume of Ford Motor Co. defense contracts has passed the billion dollar mark. Value of the new Ford tank contract is $195 million. When full production is reached, an additional 8000 workers will be required. Other Ford contracts include Pratt and Whitney engines, trucks and buses, tank engines and parts and ammunition parts.

New DO Ceilings — Effective Mar. 12, DO percentages applying to steel were raised again by NPA. Most recent percentages are: set aside of 25 pct of hot-rolled sheets plus 5 pct for plates; 20 pct of cold-rolled sheets plus 7 pct for projectiles; 25 pct for hot-rolled carbon bars and the present 45 pct for alloy bars plus a 16 pct addition during May.

Wings for the A-Bomb — The Super-Jet is already here. Last week GM announced details of its new 20,000 hp Allison-designed J35-A-23, capable of pushing an A-bomb carrier through the air at more than 650 mph.

First installation of the new engine will be on the Boeing XB-47C. Only four of the new engines will do the work formerly requiring six jet engines. Incorporating new de-icing features, a bullet nose on the air intake and an automatic ice detector, the new engine has 16 compression stages and a three-stage turbine.

THE BULL OF THE WOODS — By J. R. Williams

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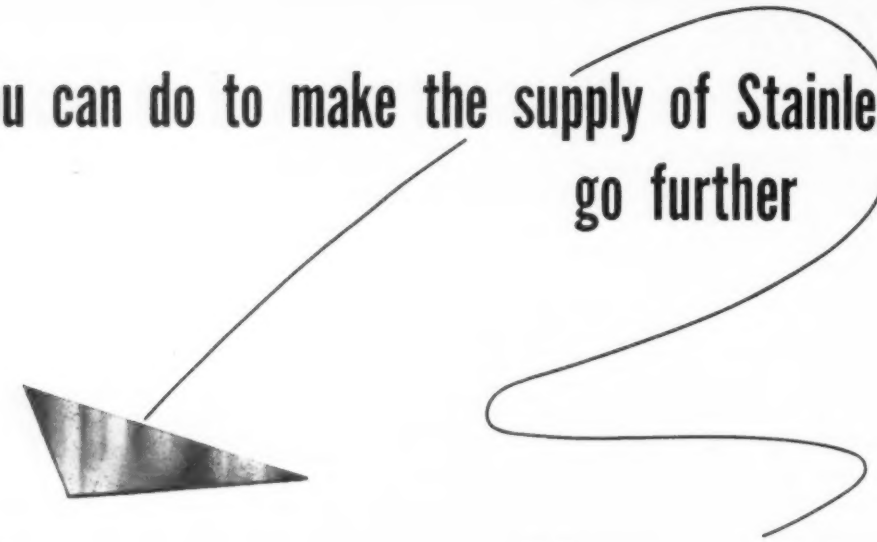

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Your supplier knows the fabricating characteristics of Stainless grades, too. Consequently, he may be able to suggest slight changes in your fabricating procedure that will speed up or simplify production. In other words, the better he understands your problem the better able he is to give you the Stainless that will do the best job for you with the least trouble and delay.

So give your supplier all the facts. And don't forget to include a definite date for delivery . . . the date when you actually plan to use the material. It will help to distribute supplies as equitably as possible.

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UNITED STATES STEEL

west coast progress report

digest of far west industrial activity

by R.T.Reinhardt

All Want DO's—Principal metal fabricators in the Seattle area, questioned by the Chamber of Commerce, report they are seeking defense orders. Of 17 companies queried nine have obtained contracts. All report difficulty in obtaining materials.

These companies average 62 employees each and 12 of the 17 held some contracts for war materiel production during World War II. The survey developed information on plant capacity, types of equipment and availability of engineering personnel.

Caught in a Vice—With few exceptions, plants are being pinched between materials curtailment and lack of defense work. In the San Francisco Bay area for the week ending Mar. 7 there were 32 prime contracts reported of which only three involved the use of metal.

Rheem Mfg. Co. last week was awarded a $2,500,000 contract for the production of shell components at San Pablo, Calif. The Southern Pacific Co. is spending 4.5 million to expedite handling of increasing freight traffic.

More Plants—Additional plants are coming into the subcontracting picture for aircraft components. Latest is Modglin Plastics Co., San Fernando Valley, adding a complete metal working plant. North American Aviation Co. has added 273,000 sq ft to its facilities at six new and dispersed locations for needed elbow room.

Faster production at Boeing Airplane Co. is having its effect on subcontractors such as Iron Fireman and Manufacturing Co. at Portland, which is installing approximately $50,000 worth of new equipment for production of parts for the new super jet B-52 bombers.

Fuel (and Pipe) Demand Rises — As western industry expands, additional gas and oil supplies are being developed which means a continuing load on plate suppliers for pipe lines.

Utah's Public Service Commission has granted Utah Natural Gas Co. a conditional certificate of public convenience and necessity to build a $32 million natural gas pipeline from southeastern Utah to Salt Lake City.

To Spend $5 Million — Byrd-Frost Inc. of Dallas, Tex. testified at the hearing that it would spend up to $5 million during the next year to prove the reserves. Much of this exploratory work is under way.

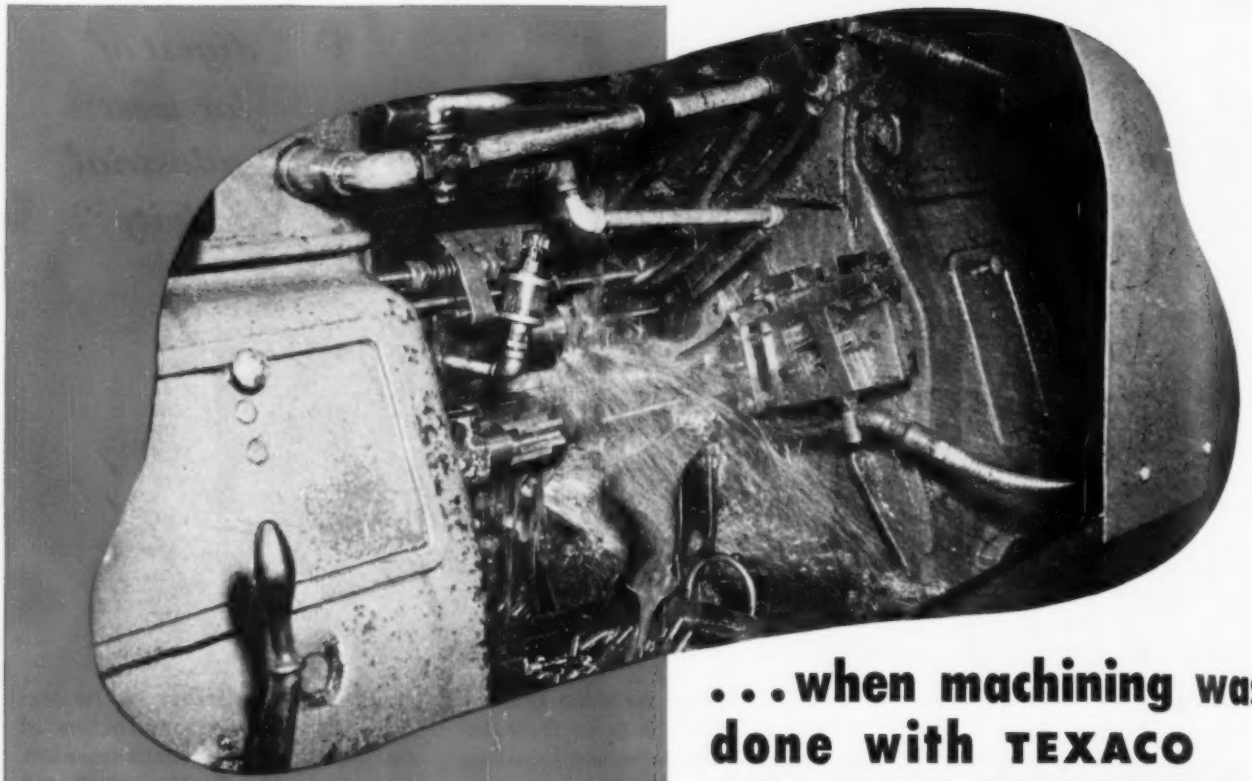
John A. McGuire, president of the pipeline company, said he did not believe the tight steel supply would seriously hold up the transmission line, but scarcity of drill pipe might prove troublesome.

Oil for Northwest — Bechtel Corp. is planning construction of an oil pipeline from Edmunton, Canada to the Pacific Coast, but according to company officials they have enough pipe on hand for the project left over from earlier Arabian pipeline contracts.

This new supply line is scheduled to bring more than a quarter of a million barrels of oil per day to Northwest industries by the early part of 1953, provided final approval is given by the Canadian government. The pipeline company is to be incorporated as the Trans-Mountain Co. to build the 700-mile long project.

Utah Fuel Merges—Kaiser Steel Corp. has taken over Utah Fuel Co. which has been a wholly owned subsidiary since the properties in Utah were purchased a year ago by the steel company.

Still Another — Even though availability of electric power for announced aluminum plants by Alcoa and Eastern Metal Products Co. is not yet certain, still another would-be producer has asked Portland, Ore., city officials for information regarding possible sites for a reduction plant. Ivan Bloch and Associates are representing the company in its search for a location and it is known that the Gulf Coast area is also under consideration.



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the federal view

this week in washington

by Eugene J. Hardy

Phony Security—Realizing that it has plunged into a hornet's nest, the Munitions Board is planning to revise its recent policy which has shut off detailed information on military contracts. (THE IRON AGE, Mar. 15, p. 97.)

At present, the Commerce Dept. weekly listing of contract awards contains only the name of the firm and the product involved. The quantity and dollar amounts have been deleted as ordered by the MB directive.

Services Get Criticized — The Munitions Board directive, it is understood, was issued without consultation with the three military departments, but the brunt of criticism regarding the shutting off of this primary source of subcontract leads has been borne by the three services.

The problem has been handed to the Secretary of Defense. The Munitions Board now says it plans a limited program of military procurement information to be instituted by Apr. 15. MB officials won't say much about what changes are contemplated except to point out that the new policy won't be tougher than the existing directive.

Ludicrous—But Harmful — Actually, those responsible for security in the three services are not sympathetic with the MB position, maintaining that such information as the number of men in the Army and the number of groups in the Air Force is common knowledge. On this basis, many officials feel that it is ridiculous to hold back detailed information on unclassified contracts for material to supply these forces.

The MB position, if not so damaging to small business, would be ludicrous since there is no objection to releasing data on individual contracts with the ban applying only to summaries of contracts such as those published in THE IRON AGE every week.

Loan for Manganese—The Export-Import Bank is putting the final touches to a credit of $30 million for the production of manganese ore in Western Brazil. The credit will go to a joint corporation with 51 pct control held by Brazilians holding the concessions and 49 pct by the U. S. Steel Corp.

U. S. Steel planned to develop this source of manganese for its own use, but additional funds were necessary for a larger development which would also supply manganese for the strategic stockpile. The terms of the credit call for 40 pct of the delivered price of the manganese to be used to pay off the loan.

Where Funds Will Go — The funds will be used for mining machinery and transportation facilities, including a barge terminal and railway connections to a barge loading point. There will also be a dozen towboats and some 68 barges to operate on the Paraguay and Parana rivers and a transshipping point to transfer to deep water vessels on the River Plata.

More Benzene From Coke—The steel industry will shortly have laid before it suggestions as to how it can step up recovery of light oils from its coke ovens for the making of vitally needed benzene. Back of this action is the fact that increased production of styrene is causing benzene supplies to be used up at a rate of more than 1,000,000 gal a month faster than it can be obtained—and coke ovens supply about 80 pct of domestic output of benzene.

NPA believes another 10,000,000 gal a year can be obtained by improving processes and installation of additional equipment.

Canadian Ore Boats—Shipment of iron ore between U. S. Lake ports will again be handled in part by Canadian operators this year. Legislation authorizing Canadian vessels to haul ore until Dec. 31 has already passed the Senate and is expected to get through the House without opposition.

This authorization has been granted to Canadian operators on an annual basis since World War II.

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RUSSIANS

have new heat-resistant alloys

Shortages of nickel and cobalt in the U.S.S.R. during World War II stimulated development of iron-chromium-aluminum alloys as a substitute for nickel chromium in electrical resistors and other high-temperature uses. The electrical resistance of such ternary alloys increases with increased chromium and aluminum contents; aluminum exerts a stronger influence than chromium.

Within recent years, alloys of iron, chromium, and aluminum have attained considerable prominence in the U.S.S.R. as materials for electric heating units. Earlier researches, chiefly in Germany and the United States, resulted in the development of some electrical resistor alloys. The best known of these alloys is Kanthal, containing up to 3 pct Co and manufactured in Sweden, and Smith Alloy No. 10, manufactured in the United States.

Scarcity of nickel and cobalt restricted the wide use of Nichrome type alloys or alloys of the Kanthal type in the U.S.S.R. Considerable attention was therefore devoted to a study of ternary iron-chromium-aluminum alloys for electrical resistors or similar high-temperature uses. The most complete investigation was carried out by Kornilov and co-workers. Results of this work were published in book form by the U.S.S.R. Academy of Sciences in 1945.

Kornilov's work covered the constitution, mechanical and electrical properties at various temperatures, scaling characteristics, and hot as well as cold-working properties of alloys containing up to 50 pct Al. The technology of the manufacture of the most promising alloys was also investigated.

Fig. 1 shows the allotropic transformation of iron-chromium-aluminum alloys. The diagram indicates the existence of a closed gamma space bounded by the gamma loops of the iron-chromium and iron-aluminum binary system, and by the surface of the ternary solid solution. Phase diagrams derived from Kornilov's experimental data indicate that, under conditions of slow cooling, an aluminum content up to about 15 pct results in a single phase—a solid solution of Fe-Cr-Al. In alloys quenched from 2100°F (1150°C), the solid-solution structure is retained up to an aluminum content of 30 pct. Above this aluminum concentration, a new phase appears—the product of a peritectic reaction between the liquid phase and the ternary solid solution.

Aluminum Raises Hardness

Results of tensile and hardness tests on ternary alloys containing up to 10 pct Al and 30 pct Cr show that, regardless of the chromium content, aluminum raises the hardness of the alloys, and that chromium is also a strong hardening element. Fig. 2 shows the effect of both chromium and aluminum on notched-bar toughness of the ternary alloys.

The electrical resistance of iron-chromium-alloys increases with increasing chromium and aluminum contents, but aluminum exerts a

stronger effect than chromium as illustrated in Fig. 3. The alloys were tested in the quenched condition. The upper graph (A) shows diagrammatically the relative effects of aluminum and chromium on the resistivity of binary iron-aluminum and iron-chromium alloys, and gives curves of equiresistivity in the ternary alloys. In the lower graph (B), the equiresistivity curves of the ternary alloys are plotted in microhm-cm. In all ternary iron-chromium-aluminum alloys, the electrical resistivity was shown to increase with rising temperature, then to level off and become practically stable at high temperatures.

Iron-chromium alloys, according to Kornilov, show a very high resistance to scaling. Even at temperatures only 100°C below the melting points of these alloys, scaling losses are under 1 g per sq m, per hr (0.00027 oz per sq ft, per hr), which is considerably less than the losses encountered in heat-resisting chromium-nickel alloys. Fig. 4 shows graphically the relationship between the composition and scaling losses of these alloys. It is indicated in these tests that the effectiveness of aluminum is much greater than that of chromium in reducing the scaling losses of these alloys.

At low temperatures, the composition of the scale shows oxides of iron, chromium, and aluminum in roughly the same proportions as the alloying elements, but at higher temperatures aluminum appears to oxidize preferentially. As an example, on an alloy containing 25 pct Cr, 5 pct Al, and the balance iron, the scale composi-

This article is an extended abstract of Russian research publications in the field of iron-chromium-aluminum alloys published by the U.S.S.R. Academy of Sciences. The reports were translated by S. L. Case *(above), Technical Advisor, Battelle Memorial Institute, Columbus, Ohio, who evaluated the significant data and compiled the accompanying article.*

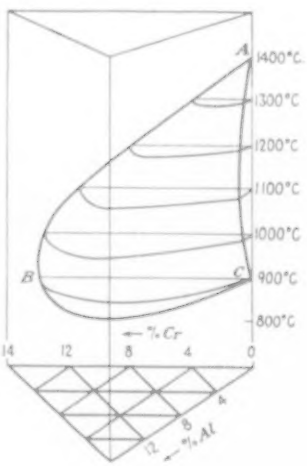


FIG. 1—Space diagram of the gamma-alpha transformation in iron-chromium-aluminum alloys, as established by Kornilov.

TABLE I

PROPERTIES OF RUSSIAN FE-CR-AL ALLOYS

Characteristics	Alloy No. 1	Alloy No. 2	Alloy No. 3	Alloy No. 4
Composition, pct				
Carbon	0.05	0.05	0.05	0.05
Chromium	16–18	23–27	40–45	65–68
Aluminum	4.5–6.5	4.5–7	7.5–12.0	7.5–12.5
Properties				
Structure	Single phase	Single phase	Single phase	Single phase
Melting temperature, °F	2720–2750	2730–2750	2840–2870	2950–3050
Electrical resistivity at 20°C, microhm-cm	130–150	140–160	180–200	200–220
Coefficient of expansion x10⁻⁶, at 20° to 100°C	14.5–15.0	14.5–15.0	16–17	16–17
Density, g per cu cm	7.0–7.2	6.9–7.2	6.8–7.0	6.75–6.85
Ferromagnetism	Magnetic to 1110°F (600°C)	Magnetic to 1020°F (550°C)	Weakly magnetic to 390°F (200°C)	Non-magnetic
Tensile strength, psi	85,000–99,000	99,000–114,000	114,000–142,000	.....
Elongation, pct	15–25	15–20	2–7	.....
Hardness, Bhn	150–170	160–180	240–260	270–300
Formability	Hot and cold	Hot and cold	Hot only	None
Product	Wire, ribbons, and sheets	Wire, ribbons, and sheets	Wire down to 6 mm (0.236 in.); ribbons down to 2 x 20 mm (0.078 x 7.8 in.); sheets down to 1.5 mm thickness (0.059 in.)	.....
Uses	Rheostats, elements for furnaces to 1830°F, hot plates, electric irons, etc.; replaces Nichrome wire.	Elements for furnaces to 2280°F, thermocouples, protecting tubes for thermocouples; replaces Nichrome wire and platinum.	Elements for furnaces to 2450°F	Cast elements for furnaces operating at 2700°F, thermocouples.

tion after an exposure of 240 hr at 2190°F (1200°C) was 98.72 pct Al_2O_3, 0.68 pct Cr_2O_3, and 0.80 pct Fe_3O_4.

The tests were made on cylindrical specimens 4 mm (0.156 in.) in diam; the duration of the tests on some of these alloys reached 3000 hr. The composition represented an average for the entire cross-section of the specimen. Since it was shown in other tests that an appreciable gradient may exist between the surface and center of specimens subjected to long exposures, the aluminum content of the surface zone in the test specimen was probably somewhat on the low side.

Higher Carbon Increases Scaling

In explaining the protective effect of aluminum in the oxidation of the ternary alloys at high temperatures, Kornilov assumes that the nature of the scale formed on Fe-Cr-Al alloys is established by three reactions:

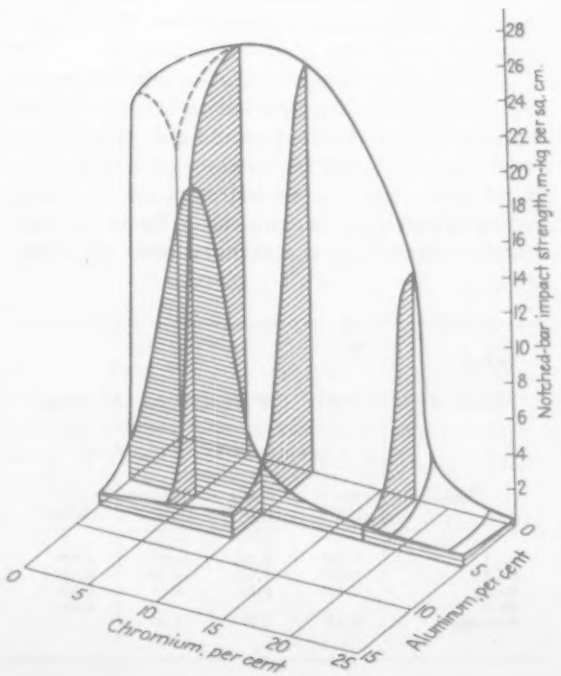
(1) $2(Al, Cr, Fe) + 4.5\ O_2 \rightarrow Al_2O_3 + Cr_2O_3 + Fe_2O_3$

(2) $Cr_2O_3 + 2Al \rightarrow Al_2O_3 + 2Cr$

(3) $Fe_2O_3 + 2Al \rightarrow Al_2O_3 + 2Fe$

At temperatures under 1290°F, the scale consists of a solid solution of the three oxides (which form an uninterrupted series of solid solutions) in equilibrium with the solid solution of iron, chromium and aluminum in the alloy. Scale formation is thus dominated by reaction (1). As the temperature is raised above 1300°F, the aluminothermic reactions (2) and (3) take place simultaneously with (1). The thickness of the oxide film keeps on increasing, and the composition of the film is changed to Al_2O_3.

FIG. 2—Effect of chromium and aluminum on the notched-bar toughness of iron-chromium-aluminum alloys.



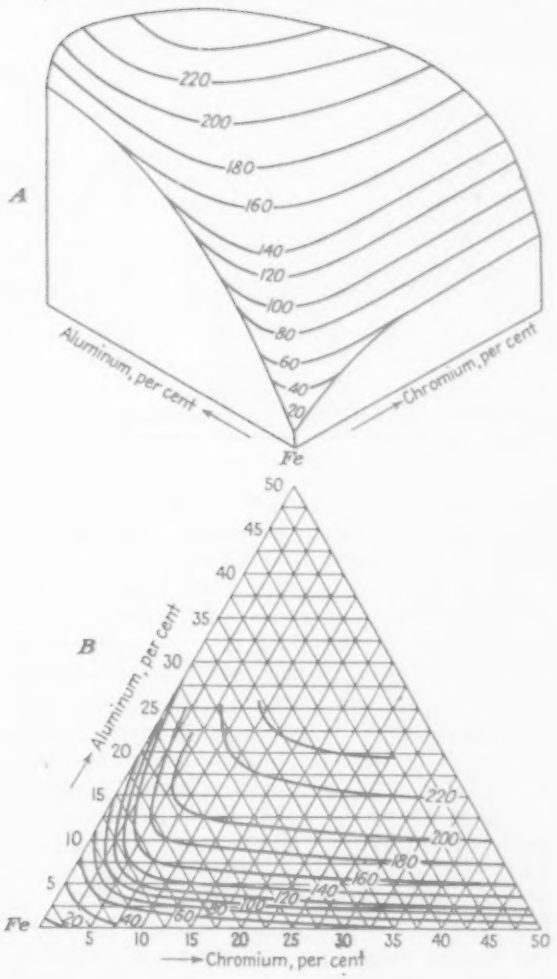


FIG. 3—In all ternary iron-chromium-aluminum alloys, electrical resistivity increases with rising temperature, then levels off and becomes stable at high temperatures. Upper graph (A) shows effects in the quenched condition. Lower graph (B) gives equiresistivity curves in microhm-cm.

This mechanism of scaling was confirmed by X-ray studies of the film formation. The resistance of iron-chromium-aluminum alloys to scaling is sharply deteriorated by an increase in their carbon content.

In a thorough investigation of a wide range of iron-chromium-aluminum alloys for heating elements, Kornilov found three regions of commercially useful alloys; these are shown in Fig. 5. Alloys in the low-chromium region contain 15 to 30 pct Cr and 2 to 10 pct Al. They are heat resistant up to 2280°F and can be hot rolled and cold drawn into fine wire or ribbon. The intermediate zone contains alloys in which the chromium content varies from 35 to 45 pct and the aluminum content is 5 to 12 pct. They are heat resistant to 2450°F and can be hot worked only. Smith Alloy No. 10 belongs to this group. The third region of useful alloys is in the chromium corner of the ternary diagram. The chromium content of these alloys varies between 65 and 75 pct, and aluminum ranges from 7.5 to 12.5 pct. These alloys are heat resistant up to 2730°F.

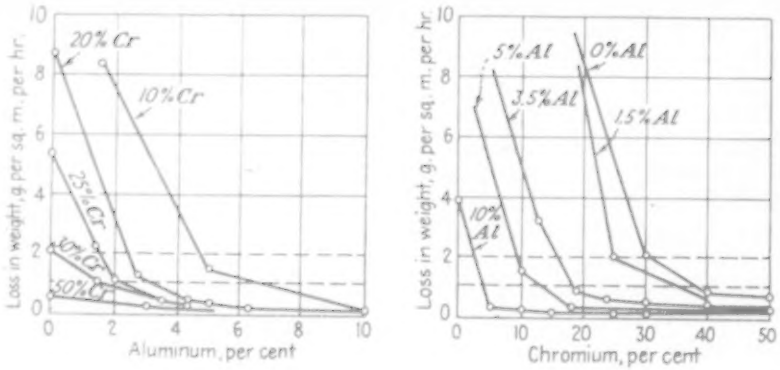


FIG. 4—Aluminum appears to be much more effective than chromium in reducing scaling losses of the iron-chromium-aluminum alloys at 2190°F, as shown above. Duration of tests was 240 hr.

RUSSIAN DEVELOPMENTS (continued)

They are very brittle and cannot be deformed either hot or cold, so that their application is confined to cast and ground parts.

Based on these studies, four types of iron-chromium-aluminum alloys were adopted for industrial use in the U.S.S.R. The composition and typical physical and mechanical properties of these alloys are given in Table I, and their heat resistance at various temperatures, in comparison with that of standard Nichrome (containing 0.18 pct C, 60 pct Ni, 20 pct Cr, balance iron), is shown in Table II. The mechanical properties of alloys 1 and 2 at various temperatures were also investigated by Kornilov; results of these tests are summarized in Table III. It was pointed out that carbon strongly influences the impact toughness as well as the heat resistance of these alloys. On alloy 2, for instance, an increase in carbon content from 0.03 to 0.07 pct lowered the impact strength at all temperatures by about 25 pct.

Used Extensively In U.S.S.R.

The mechanical and physical properties of iron-chromium-aluminum alloys undergo an appreciable change during prolonged service at high temperatures. For instance, the initial structure of alloy 2 consists of small grains. After 240-hr exposure to a temperature of 2200°F (1200°C), the grains coarsen so much that the cross-section of a wire 2 mm in diam may consist of only 2 or 3 grains. This grain coarsening leads to brittleness. The electrical resistivity also changes, but the change is not very great. As an example, in alloy 2, a loss of approx 10 pct in electrical resistivity at room temperature occurred after 500-hr service at 2300°F.

The use of iron-chromium-aluminum alloys for heating elements is apparently more extensive in the U.S.S.R. than anywhere else in the world. The development of a satisfactory steelmaking method for tonnage production of these alloys has therefore been a subject of great practical interest. The basic requirements of a high-grade product were found to be freedom from alumina inclusions, a carbon content as low as is possible to attain economically (under 0.05 pct), and a minimum of silicon and manganese. One method which it is claimed has been used successfully in large-scale manufacture of these alloys employs a combination of open-hearth and arc-furnace melting equipment.

A low-carbon charge is melted in an open-hearth furnace and reduced to 0.025 to 0.05 pct C; a charge of low-carbon ferrochromium is simultaneously melted down in an arc furnace. At the end of the refining period, the ferrochromium is tapped into a small transfer ladle. From this ladle, the ferrochromium is poured into a large teeming ladle containing molten aluminum, and the open-hearth iron melt is then tapped into the same teeming ladle. The violent mixing that takes place in the ladle assures a uniform product within the desired specifications.

Aluminothermic Method Proposed

Unless expensive carbon-free raw materials are used, ternary alloys prepared either in an open-hearth or electric furnace are bound to have a carbon content high enough to have a deleterious effect on its high-temperature properties. Kornilov proposed, therefore, an aluminothermic method of manufacturing the ternary alloy directly from chrome ore concentrates. The method embraces two steps.

The first step consists of roasting the chrome ore concentrate with lime at high temperatures, thus converting the chromium oxide into calcium chromate which carries more oxygen than chromium oxide. In the second step, calcium chromate and ferric oxide are reduced by an aluminothermic reaction into a ternary alloy of a high

TABLE II

HEAT RESISTANCE OF FE-CR-AL ALLOYS

Alloys	Loss in weight, g per sq m per hr, at			
	2010°F (1100°C)	2190°F (1200°C)	2370°F (1300°C)	2550°F (1400°C)
No. 1	0.385	0.173	0.216	0.700
No. 2	0.013	0.058	0.146	0.490
No. 3	0.020	0.04	0.10	0.300
No. 4	.....	.....	.....	0.250
Nichrome	0.320	2.77	2.80	.....

TABLE III

PROPERTIES OF ALLOYS 1 AND 2 AT VARIOUS TEMPERATURES

Testing Temperature		Alloy No. 1 (0.03 pct C, 17 pct Cr, 5.6 pct Al)				Alloy No. 2 (0.03 pct C, 25 pct Cr, 5.07 pct Al)			
°F	°C	Tensile Strength, psi	Elongation, pct	Impact Value, m-kg per sq cm	Resistivity, ohms per sq mm per m	Tensile Strength, psi	Elongation, pct	Impact Value, m-kg per sq cm	Resistivity, ohms per sq mm per m
Room temperature		92,500	20.0	1.5	1.35	94,500	18.5	0.75	1.37
210	100	.....	.....	.....	.....	91,000	21.9	.....	1.37
390	200	85,000	25.0	24.0	1.34	86,500	23.2	12.5	1.37
570	300	.....	.....	27.3	1.35	86,800	25.9	22.5	1.37
750	400	79,000	28.2	26.2	1.39	81,500	22.4	19.2	1.37
930	500	.....	.....	24.5	1.40	72,500	23.5	17.1	1.38
1110	600	45,000	30.6	26.2	1.42	48,000	31.0	19.0	1.41
1290	700	.....	.....	25.3	1.42	24,000	43.0	25.5	1.42
1470	800	10,000	67.1	23.1	1.44	10,100	67.0	27.5	1.43
1650	900	.....	.....	19.2	1.45	6,000	90.2	21.0	1.435
1830	1000	3100	91.5	15.5	1.46	3,600	90.8	16.4	1.436
2010	1100	.....	.....	.....	1.48	.....	.....	14.2	1.440
2190	1200	700	.....	.....	1.49	850	.....	.....	.....

chromium content. This alloy can be diluted by addition of ingot iron to give the desired composition. Kornilov does not indicate whether or not his aluminothermic method has been tried on a production scale.

It is claimed that alloys 1 and 2 are hot rolled without difficulty into wire 5.5 mm (0.217 in.) in diam or ribbons 2 mm (0.078 in.) in thickness. The recommended temperature for rolling ingots into billets is 2200° to 2280°F. The finished products are rolled at a temperature of 2000° to 2100°F. The hot-rolled wire from alloys 1 and 2 can be cold drawn down to a diameter of 0.03 to 0.04 mm (0.0012 to 0.0015 in.). The cold-drawn wire is then heated to a temperature of 1300° to 1350°F for 30 min and quenched in water. Cold-drawn ribbons are subjected to the same treatment, to eliminate the effects of cold work.

Lower Carbon For Longer Life

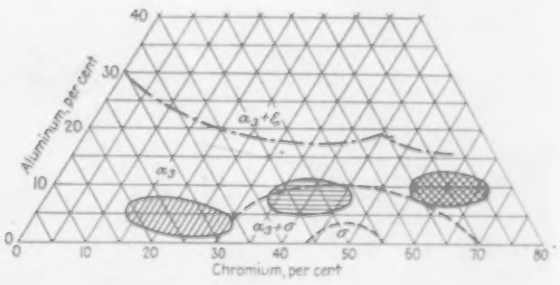
Alloy 3 is hot rolled to the same dimensions as alloys 1 and 2 but is rolled at a somewhat higher temperature. The hot-rolled wire and ribbon cannot be cold drawn. Alloy 4 can be used only in the cast state. Heating elements from this alloy are cast in iron molds preheated to 1830°F. Alloys 1, 2, 3, and 4 can be either torch welded or arc welded. For arc welding, he recommends the use of an electrode with a carbon content under 0.05 pct and with a titanium content of 0.5 pct, or over. For torch welding, a flux of KCl and CaF_2 in 1:1 ratio apparently gives very satisfactory results.

Wire and ribbon from alloy 1 are employed for resistors in furnaces of capacities ranging from laboratory size to industrial furnaces of 900 kw. In sealed elements, the maximum working temperature is 1650°F; for exposed elements, the maximum temperature is 1830°F. At a working temperature of 1470° to 1650°F, some furnaces have been in continuous operation for over 10,000 hr.

Alloy 2 is employed for heating elements at temperatures up to 2200° to 2280°F, thus replacing platinum. In cases these elements were in continuous use for 12,000 hr at temperatures of 1550° to 1650°F and are still in operation. In furnaces operating continuously at a temperature of 2280° to 2320°F, the life of the resistor elements ranged from 1200 to 8000 hr. Alloy 2 is also used for protection tubes, rheostats, vacuum tubes, and precision instruments.

Hot-rolled wire and ribbon from alloy 3 are used for heating elements in furnaces operating at temperatures up to 2450°F for continuous service, and 2550°F for short intermittent service. Cast elements from alloy 4 are used for heavy-duty melting furnaces at temperatures up to 2370°F. The useful life of such elements is strongly influenced by the amount of carbon in the alloy. For long life, carbon under 0.03 pct is desirable.

FIG. 5—Regions of commercially useful alloys in the iron-chromium-aluminum system. Alloys in the low-chromium region are heat resistant up to 2280°F and can be hot and cold worked. Alloys in the intermediate region are resistant to 2450°F, can only be hot worked. High-chromium region has alloys resistant to 2730°F, but which can only be used in the cast state.



By WALTER RUDOLPH
Consultant, Erie, Pa

Special devices up welding efficiency

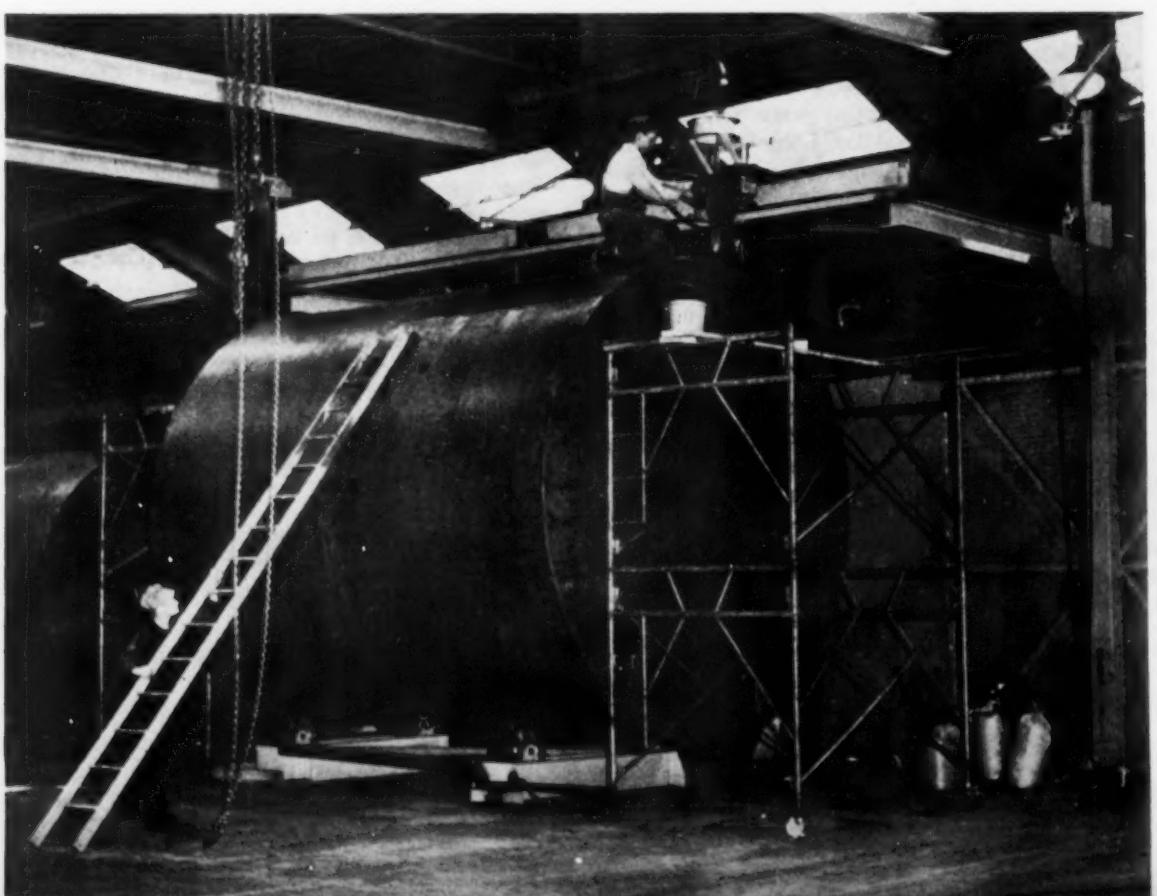
Maximum efficiency in heavy welding operations is obtained by good plant layout and special equipment at National Tank Co.'s new plant. Both built-in and portable setups have been designed and built to mount manual and automatic hidden-arc welding heads. This equipment simplifies and speeds heavy welding on large tanks and pressure vessels.

Many interesting special welding setups have been designed and built by the National Tank Co., Tulsa, Okla., for use in their new plant. These greatly simplify and speed the making of heavy circumferential and longitudinal welds on tanks and pressure vessels of varying shape and size. Welding operations are more efficient, and high quality welds are produced.

The new welded rigid frame plant building, covering over five acres, is divided into four main assembly bays: a welded tank bay, a treater assembly bay, a separator assembly bay and a heavy weld bay. Two subassembly bays service these main areas while one fabricating and plate preparation bay services the subassemblies.

Automatic and manual hidden-arc welding facilities have been devised to meet the particular production requirements of each of these bays. By developing techniques to use automatic possibilities to the fullest, highly skilled personnel is

FIG. 1—National Tank's setup, attached to building columns, for automatic hidden-arc welding of large tanks. Head travels along beam for longitudinal welds is stationary while rolls turn tank for circumferential welds.



relieved from routine lengthy welding operations to perform jobs requiring closer personal attention.

Fig. 1 shows welding operations in the 360x60-ft welded tank bay. This bay is serviced by overhead trolley cranes and is equipped with stationary trunnion rolls for tank welding. Standard Lincolnweld automatic welding heads for hidden-arc welding are mounted on carriages which ride beams attached to the building columns. The head is moved for making longitudinal seam welds and the tank is revolved for making circumferential welds.

The 360x60-ft heavy weld bay, shown in Fig. 2, has a unique setup for fabricating vessels up to 12 fr in diam, any length, and with shell thickness up to 2 in. The vessels are placed on special automatic welding cars designed and built by National Tank. For making longitudinal welds, these gear-driven cars move the work along tracks laid adjacent to the line of building columns where automatic heads are installed. Rollers are built into the cars for revolving the shells to make circumferential welds. Rollers have rotation speeds up to 42 ipm, while cars can be moved at speeds up to 42¼ imp.

Welding Heads Stationary, Work Movable

The welding heads are stationary, the work being moved for making both longitudinal and circumferential welds. For making longitudinal welds, the automatic head is mounted on an arm as shown in Fig. 2. The arm extends into the shell for making inside seams and is raised for making outside seams. The work is moved to another station, Fig. 3, for making circumferential welds.

Another unique welding setup, which gives the shop a high degree of flexibility, is seen in Fig. 4 in operation in the treater bay. A special dolly cart with an adjustable platform for the operator has been made for using manual hidden-arc welding equipment. The standard dc motor generator set is mounted on the dolly cart. Current from this set is conducted to the electrode wire feed mechanism mounted on an adjustable platform that is raised or lowered to suit the job. The operator works from this platform with a welding gun to which current and electrode wire is fed through a cable from the automatic feed mechanism.

Several of these units are in operation. They add flexibility to the shop because they can be brought to the work rather than taking the work to the welding station. This keeps material in process moving, eliminates handling of bulky items and makes more floor area productive. Another advantage is that these units can be used for regular hand welding as well as manual hidden-arc welding. With them the operator can do both tack welding and finish welding. This means that machinery and capital are not tied to one specialized operation.

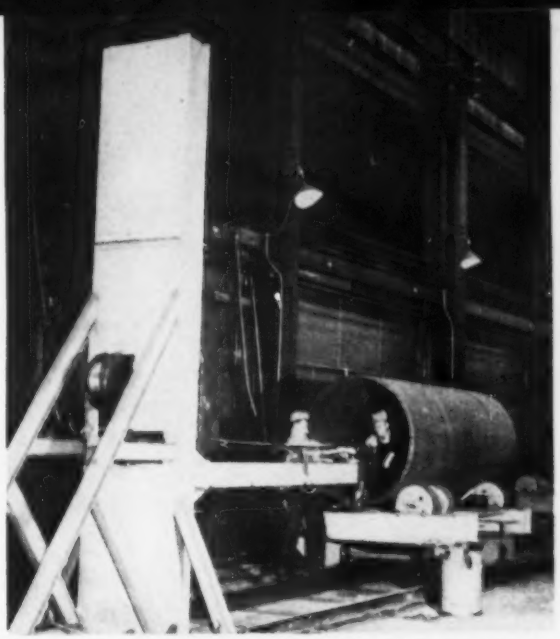


FIG. 2—Lincolnweld head on stationary column in National Tank's heavy weld bay for longitudinal welds can be raised or lowered. Work moves on special automatic cars.

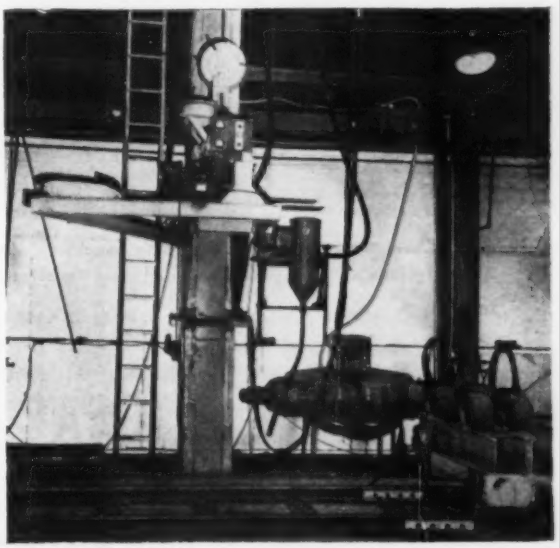


FIG. 3—Station for making circumferential welds in heavy weld bay. Head on special column can be raised or lowered. Work is rotated on automatic car. At right of column are flux recovery unit, dc welding generator, automatic car.

FIG. 4—One of National Tank's special dollies for bringing manual hidden-arc welding equipment to work. Wire-feeding apparatus is on top platform, welding generator on lower.

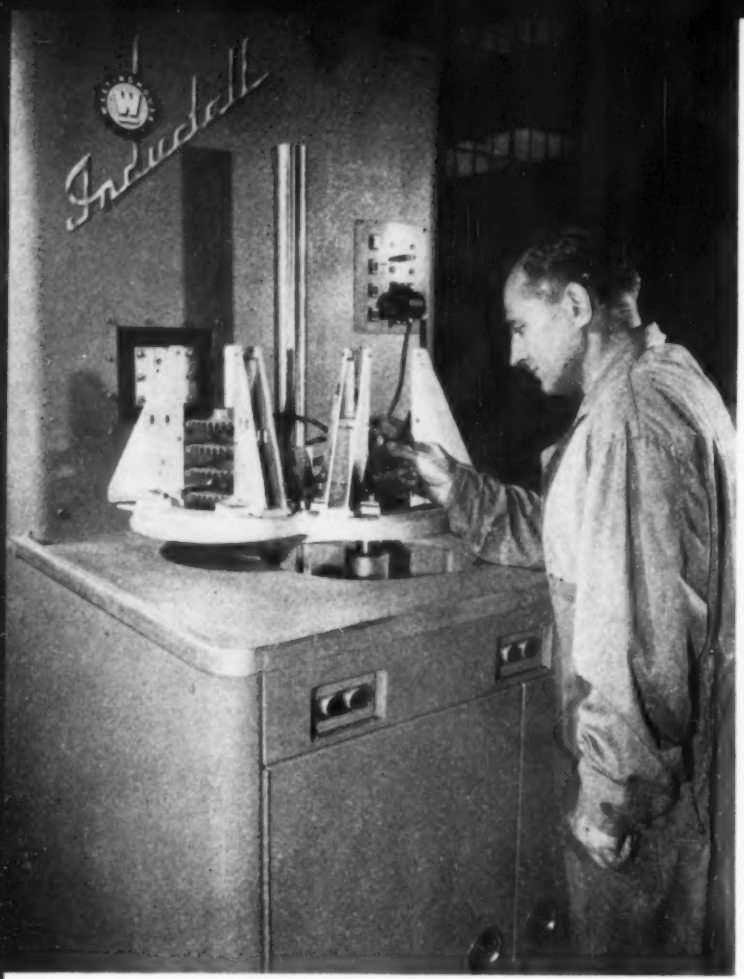


FIG. 1—The "Inductall" gear-hardening machine, with its automatic loading and unloading equipment in place.

In 38 to 45 sec—depending on whether the automatic loader is used—this machine preheats, contour-hardens and quenches any induction-hardenable steel.

Designed for high production, it can also be used for through hardening.

GEAR HARDNER LOADS AND UNLOADS *automatically*

A new high-production machine contour-hardens gears in six steps, Fig. 1. Able to handle gears ranging from 2½ to 8¼-in. pitch diam, it will harden any of the induction hardenable steels. The machine is made in only one size and with handloading its total processing cycle takes 45 sec. With the automatic loader, this time is 38 sec. A typical cycle for hardening a 7-pitch spur gear of 5½-in. pitch diam and ½-in. face is given in the table on facing page.

By PAUL GOOD
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By the use of an automatic loading and unloading device, approximately six average-size single gears or three or four cluster gears can be accommodated in this machine. Gears placed in a dispensing magazine are transferred to a spindle which carries them to an inductor coil, where they remain during preheating, soaking, and a period of radio-frequency contour heating.

The spindle then transfers the gears to the quench position, delivering the treated gears to a receiving magazine. Limit switches initiate new cycles as long as gears remain in the dispensing magazine, and also prevent a new cycle from starting if the receiving magazine is full.

This machine is equipped for setup jogging, for hand-cycling the gear through its various operations, as well as for fully automatic operation. The control mechanisms governing all the machine's functions are accessible through the front doors of the equipment, facilitating adjustments required during setup. The machine can be set up and operated by unskilled or semi-skilled labor.

Hardening Cycle Is Short

Fig. 2 shows the automatic operation of this equipment. In step 1, the spindle is in its upper position, and has picked up the bottom gear in the automatic loader. Next, the spindle rotates as it lowers the gear to the work coil. Here, a 10,000-cycle, audio-frequency preheating power is applied for approximately 15 to 20 sec. In operation 3, the gear remains in the work coil during a 10- to 15-sec soaking period. The gear is then heated by 200,000-cycle radio-frequency energy for approximately 1 sec in the same work coil.

After this cycle, the gear is moved rapidly to the quench position. Following the 8- or 10-sec waterspray quench, it is raised and unloaded into the receiving magazine. The spindle then lowers about 3 in., the loader oscillates to the position shown in step 1. The spindle rises, picks up another unhardened gear and then is ready for the next cycle.

CONTOUR-HARDENING CYCLE

Preheat with 10,000 cycle power	16 sec
Soak (no power applied)	13
Hardening (R.F. heat with 200,000 cycle power)	1
Quench	8
Load and unload	7
Total (for hand loading)	45 sec
With automatic loader	38 sec

This is the sequence of operations for contour-hardening. If through-hardening is desired, the soak and radio-frequency heating cycles are bypassed. If a submerged oil quench for through-hardening is desired, the work coil is raised and an oil pot installed in the sink.

Fig. 3 shows the mechanical drive system which controls the hardening operation—the cam drive system, the sink and spindle and the automatic loader. The cam shaft is powered by a gear motor and is driven through a positive chain drive. The work spindle is raised and lowered by a plate cam, follower shaft, spindle-lift arm and a connecting link.

A cylindrical end cam, a follower arm, and an oscillating shaft drive the automatic loader. The spindle is rotated by a separate motor which carries a variable pitch V-pulley, with an adjustable spindle speed ratio of 2:1. The spindle lift arm and the oscillating shaft both have automatic reset, overload release mechanisms, to safeguard the machine against faulty setup or gear defects such as burrs, undersize bores or other flaws.

In addition to contour and through-hardening, the machine can be used for other miscellaneous

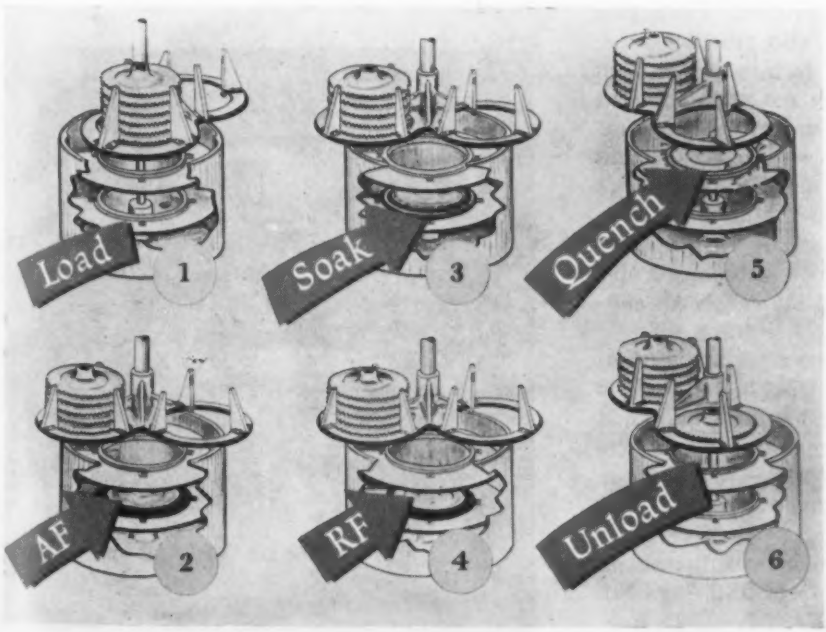
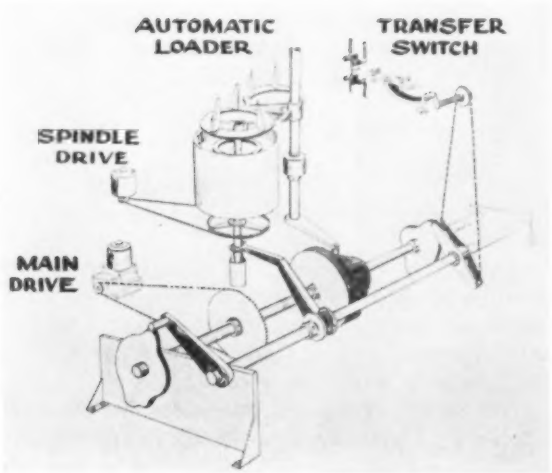


FIG. 2—This is the sequence of steps that the machine carries gears through in contour-hardening them.



GEAR HARDNER (continued)

jobs, such as the hardening of integral spindle gears. The automatic unloader support shaft serves as a rigid tool post. A support head and a follower spindle are added. The gear is lowered and hardened within the sink. This same machine also can harden shafts up to 9 in. in length by the scanning method. In this type of progressive hardening, the shaft is raised rapidly and then lowered slowly through the heating and quenching coils.

FIG. 3—This mechanical drive system is used to control the hardening operation.

Measures rolling mill load continuously

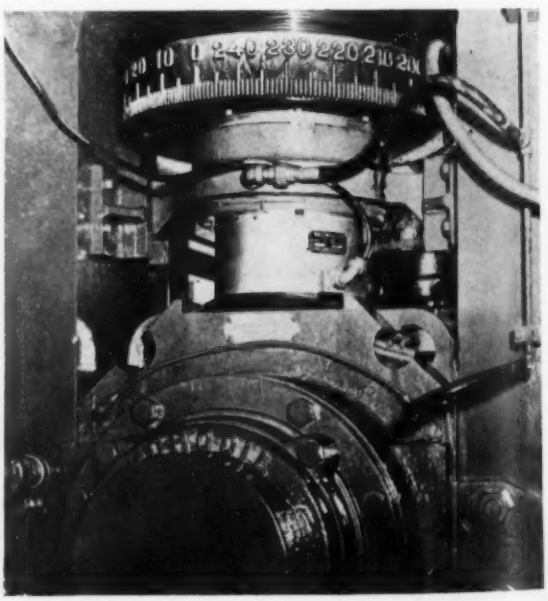
hort steel columns on which SR-4 strain gages are bonded have been installed in the cold-roll strip-mill at the Edgewater plant of the Aluminum Co. of America. These new load-weighing devices, made by Baldwin-Lima-Hamilton Corp., Philadelphia, provide accurate, continual indication of roll loads. They make it possible to adjust roll load during actual rolling. Off-gage thicknesses can be corrected without waiting for a whole strip length to go through. Protection against bearing overloads is also provided.

One of these new devices is installed at each end of the mill rolls, and they are actuated when compression of the column changes the electrical resistance of the fine grid wire of the strain gages. Four of these wires are used in each gage and they are wired together in the form of a Wheatstone bridge. The load may be measured by any one of several types of instruments, including recording and indicating equipment calibrated directly in pounds or other units.

Accuracy of measurement is high and permanent. An overall accuracy of 1 pct of full scale is guaranteed under normal mill conditions. Load cells are compensated for temperature variations so that they give good, reproducible accuracy over a range of ±50°F from normal operating temperature.

The Alcoa mill in which this new equipment is used reduces aluminum strip from USS Gage No. 11 (⅛ in.) to USS Gage No. 24 (0.025 in.). Load capacity of the mill's two cells is 600,000 lb each. Service in this particular installation has indicated that practically no deformation occurs under wide variation of load.

SR-4 strain gages are bonded to short steel columns in this Alcoa mill, immediately above the roll itself. They provide accurate, continual indications of load and make it possible to control thickness as the strip is produced.



CHARGING SIDE of Armco's new No. 2 openhearth shop shows two trainloads of scrap buggies ready to roll into the basement. From here they will be taken up individually on hydraulic hoists to the charging floor.

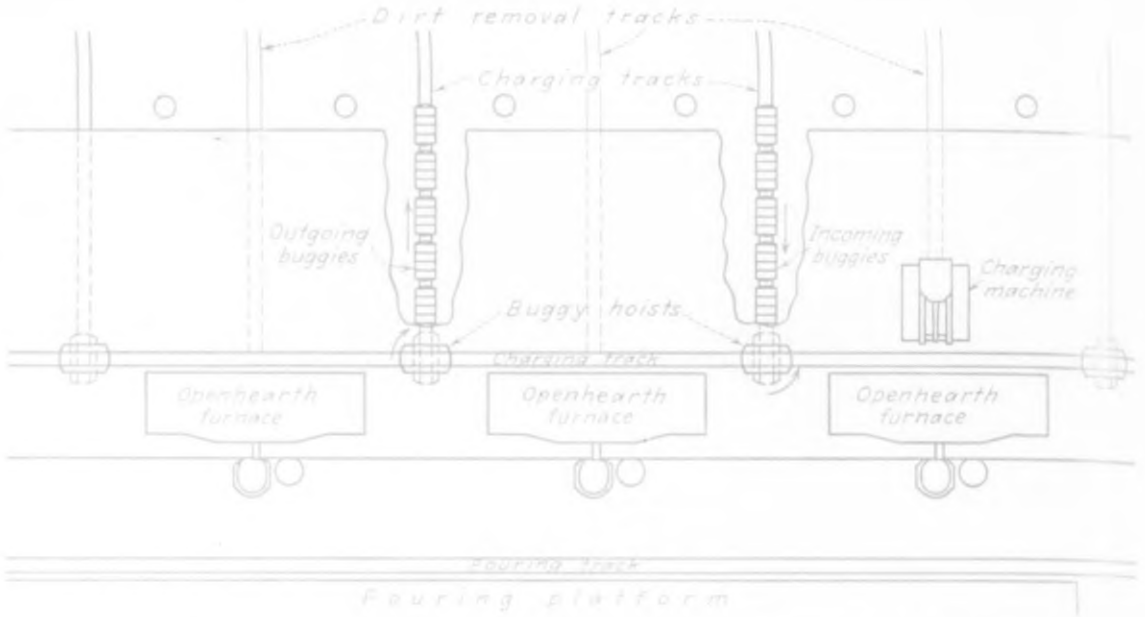
How GOOD MATERIALS HANDLING helps Armco

Unique scrap handling, a raw materials conveyer, a dirt removal system, use of lift trucks and palletized loads and plenty of room to move around combine to make the world's newest openhearth shop outstanding in the industry.

A combination of materials handling methods unique in the steel industry features the new No. 2 openhearth shop of Armco Steel Corp. at Middletown. From its novel charging setup to the handling of refractories—even to the design of the ladle crane—the shop's technique is outstanding.

The hydraulic scrap hoist method of charging its three 225-ton openhearths permitted Armco's design engineers to do a lot of things no other shop can do. (Though properly called "hoists," these devices are really materials elevators moved by hydraulic pistons.) It also forced some basic changes in the conventional methods of getting refractories, additions, etc., to the furnaces. And because the shop was laid

By G. F. SULLIVAN
Managing Editor



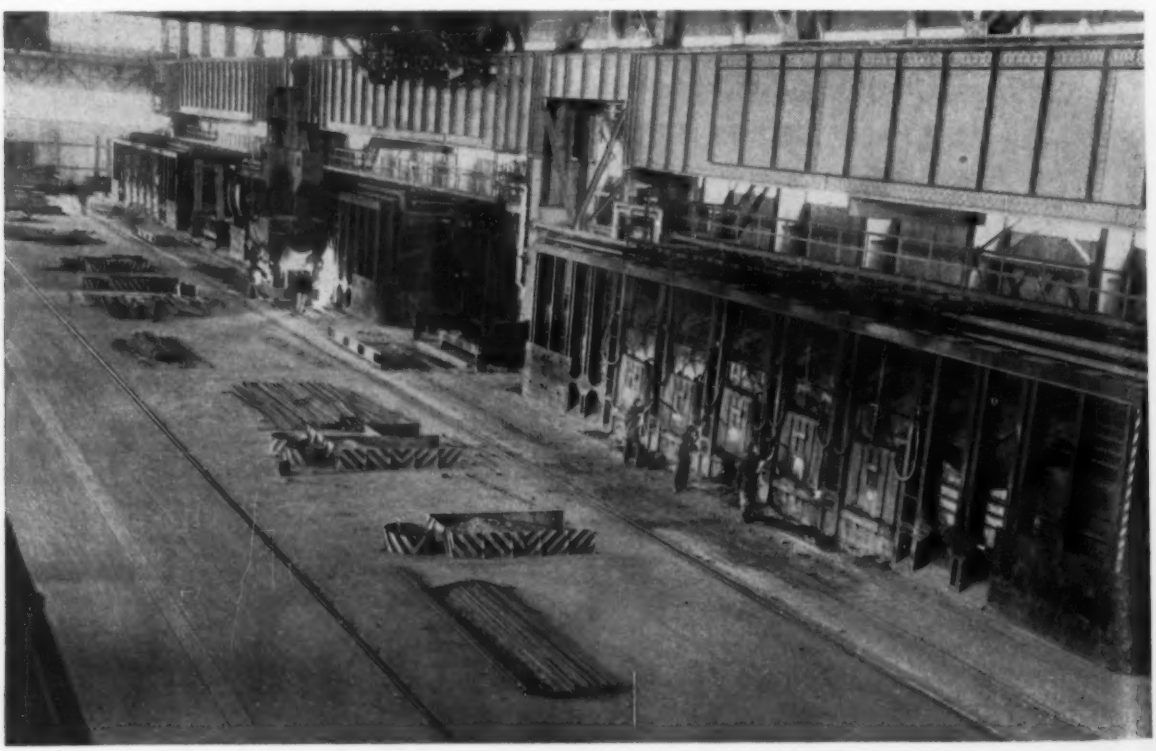
PLAN VIEW of the shop shows how four main tracks serve the three furnaces. Only one of the two charging machines is shown. The three tracks running to the center of the furnaces are for removing flue dust and old brickwork.

MATERIALS HANDLING (continued)

out from scratch in a cornfield there was no premium on land. The charging floor (see cut) is "wide open space."

Several advantages naturally follow. One is faster charging. Just how much faster it will finally be, Armco engineers can't say definitely at present because the shop is using only 20 pct hot metal. Since 80 pct of the metallics are now being handled in charging boxes the saving in charging time is even more marked than it will be when hot metal supply is increased by new blast furnace now being built. Another advantage in the system is that furnace brickwork can easily be repaired or replaced because

WIDE OPEN SPACES: This shot shows the amount of room available on the openhearth charging floor. Typical of new openhearth shop construction, the shop roof is supported by heavy girders over the furnaces, eliminating columns here and on the pouring floor.



there are no boxes or buggies cluttering up the floor. But the most important gain is the ability to charge a furnace when it is ready for charging and to make additions when they are needed: With no time wasted waiting to clear the doors, heat time is less.

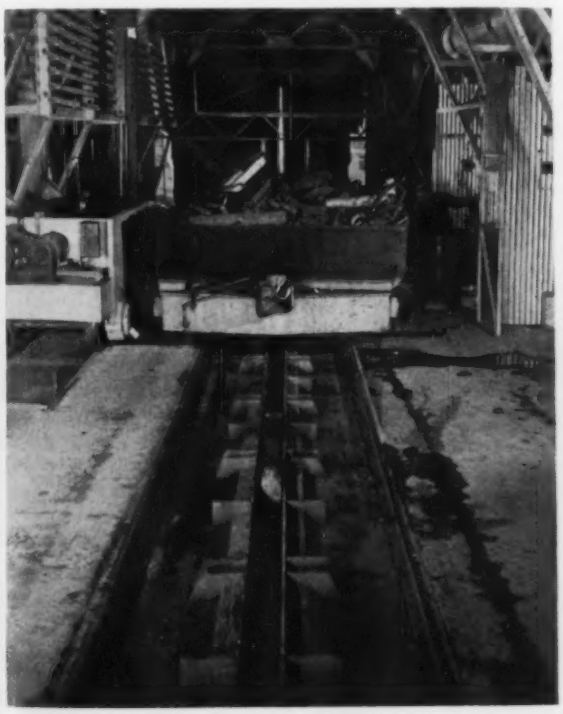
The floor plan (see cut) shows the four hydraulic lifts that serve the furnaces. (The track approaching the center of each furnace is a dirt track for removal of flue dust and old brick.) Scrap buggies are loaded in the preparation yard, with the axis of the charging boxes at right angles to the tracks, as usual. The train of buggies is pushed into the shop basement where the front car is grasped by a cager, a hydraulic arm that moves it onto the hoist. The hoist rises some 15 ft to the charging floor, turning 90° on the trip up. This lines up the buggy so the charging machine can grasp the boxes.

When a furnace is being charged, the hoist on one side brings up the full boxes. Once emptied, the boxes are put on a buggy and then on the hoist at the other side of the furnace so they can be taken down and hauled backed to the scrap yard.

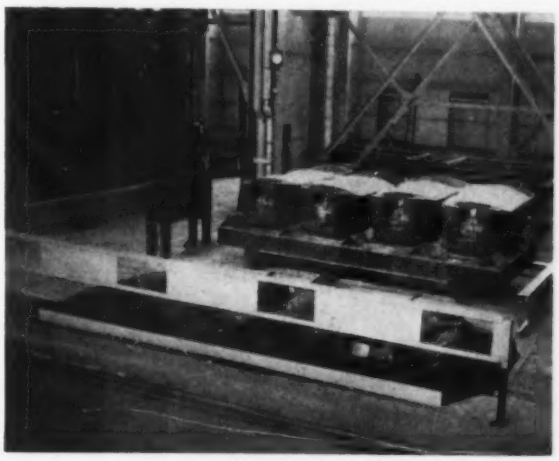
The arrangement of scrap hoists required that the two charging machines be designed for higher than usual speed. This is because charging boxes are moved by machine for greater than usual distances.

Other ways in which Armco engineers have

SCRAP LADEN BUGGY approaches the hoist. At left is the cager which will move it onto the hoist. Hydraulic ram of the hoist in the up position can be seen in background. Device in center is continuous chain that moves buggies into reach of the cager (left).

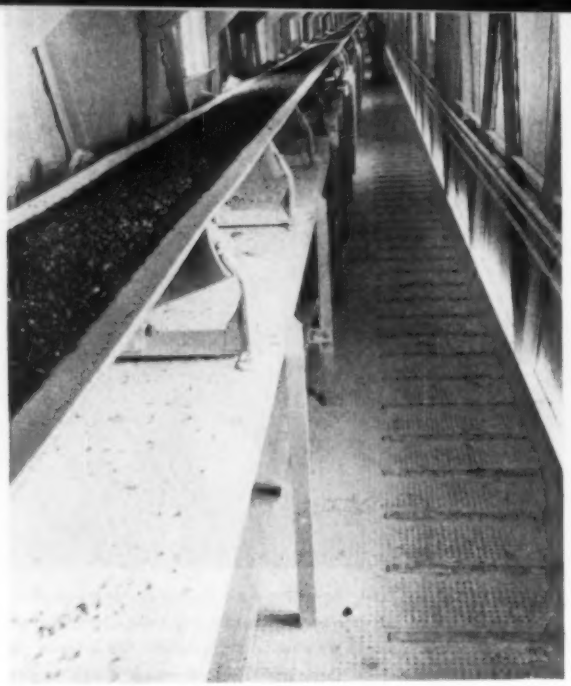


CAGER OPERATOR handles controls that operate arm (left) to push scrap buggy onto hydraulic hoist. In this shot, the buggy is almost in position on the hoist. On its way up the device will rotate through 90° to line up the charging boxes with the ram of the charging machine.



ALMOST UP: Just behind the guard rail in the foreground an ascending buggy can be seen on the hoist. Once in position its tracks will line up with those on the floor so it can be moved closer to the furnace. Storage rack (background) holds pans of burnt lime.

MAGNAFER drops from a hopper railroad car into a track hopper some 500 ft from the openhearth shop where all bulk refractory materials are unloaded. The track hopper is connected to bins above the charging floor by the conveyer shown in the next picture on p. 78.



ON ITS WAY: Magnafer moving from the track hopper up an inclined conveyer belt en route to No. 2 openhearth shop. The belt will drop it into one of a number of storage bins (see next photograph) at one end of the shop on a level above the charging floor.

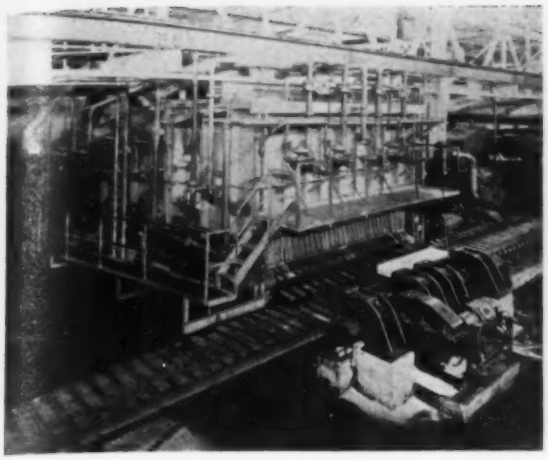
BURNT LIME flows from a storage bin to a pan on a buggy on the charging floor level. This buggy track is at right angles to the charging track; it crosses it at one end of the shop to the area where lining guns are loaded. Other refractories are in adjacent bins.

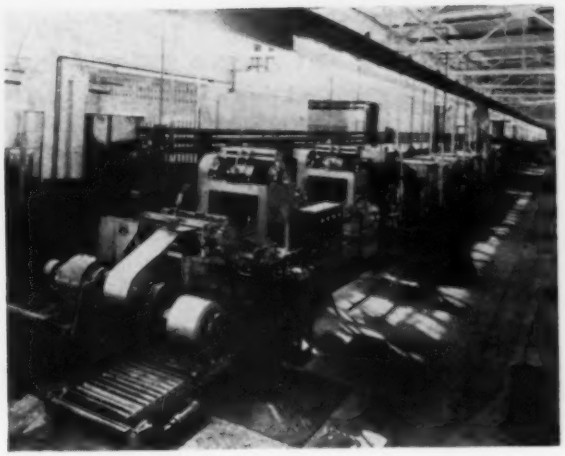
MATERIALS HANDLING (continued)

taken advantage of mechanical materials handling are illustrated on these pages. This includes somewhat unusual ways of handling burnt lime and refractories and central location of all service facilities. The first furnace was started up only last October, so it is too early to measure the overall gain in efficiency in this new plant. But it will be substantial.

RAMP from ground level leads up to charging floor. Lift trucks carry brick and other refractory materials for furnace repair up this ramp from storage areas in basement and outside the building. Brick is palletized. Shovel trucks haul bulk repair materials.

CRANE CAB has excellent visibility. Unusual crane design puts equalizer sheaves, drums, gear cases, etc., all on top of trolley for easier servicing. Crane also carries its own "scaffolding" for quick accessibility from any point on the pouring floor. The operator has a special escape walkway.





New brass strip mill now in production

The American Brass Co., Buffalo, N. Y., has recently completed some new mill equipment installations. The brass cake heating furnace, above, will supply 40,000 lb of slab per hour to the hot rolling reversing mill. This Rockwell furnace is 56 ft 7 in. long and 11 ft high, and heats brass cakes up to 3200 lb each.

In the new brass strip mill is a continuous strip annealing and pickling line also built by W. S. Rockwell Co. This installation shown above is designed to handle between 1000 to 6000 lb of 26 in. wide strip per hour. Strip gages ranging from 0.003 to 0.040 in. thick are handled in this 160-ft long processing line.

Prestressing increases aluminum fatigue life

The fatigue life of structural aluminum alloy sections has been increased by prestressing the material. This was particularly noticeable at lower stresses when a comparatively small number of cycles of dynamic prestress were applied. On the other hand, there were cases when little improvement resulted, and at some stresses fatigue life was shortened by prestressing.

Two means of prestressing were employed in these tests by the National Bureau of Standards. In the first, a high static load was applied to the specimen before the start of the fatigue test. In the second, the specimen was stressed in the fatigue-testing machine for a predetermined number of cycles at one amplitude, then tested to failure at a second amplitude. Conventional repeated-bending fatigue-testing machines were employed. The dynamic studies were made with Alclad 24S-T sheet.

The static-prestressed tests were made with Alclad 24S-T sheet. Fatigue tests were made with specimen bent in only one direction from the no-load position. The prestress load was applied in some cases in the same direction as the test load, some in the opposite direction.

At high test stresses such as 25,000 and 35,000 psi, the effect of the static prestress was negligible. At a test stress of 20,000 psi there was an appreciable decrease in life for specimens prestressed in the direction opposite to that of the subsequent fatigue stress. With the same test stress, specimens prestressed in the same direction as that of the test stress showed a slight increase in life.

Marked differences in life was obtained with dynamic prestressing. At high prestress amplitudes of 22,500 and 32,500 psi, fracture occurred earlier in prestressed samples than in the original material. For the lowest prestress, however, the behavior was entirely different. Using a test stress of 20,000 psi, an increase in fatigue life of 400 pct was obtained when the prestress amounted to 2 million cycles at 17,000 psi. Even when prestressing consisted of 20 million cycles, fatigue life was increased about 33 pct.

The immediate importance of this work is the possibility of improving the fatigue life of structural members by prestressing. It may also offer valuable aid toward determining the mechanism of fatigue failure in metals.

Buick Motors has a new packaging machine which automatically sorts, counts and packages a wide variety of small parts at high speeds. It will eventually package more than 2000 different parts, in different sizes, shapes, quantities and types of packages. Time to change over from one part to another is usually less than 3 min.

Automatic packaging machine handles varied parts

By WALTER G. PATTON
Detroit Editor

Buick Service Parts Div. warehouse at Grand Blanc, Mich., has installed a new automatic packaging machine that relieves workers of the tedious and monotonous job of picking up small parts by hand, counting them and dropping these parts into a paper box or an envelope. Eventually, this single machine is expected to handle 75 pct of more than 3000 different parts required by Buick dealers.

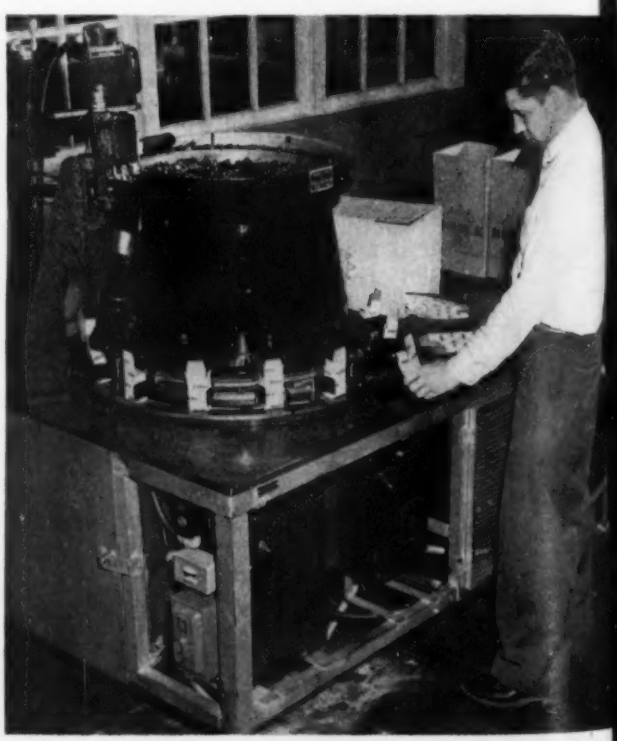
Maximum sorting and packaging rate of the machine is 13,000 piece per hr. A typical setup calls for the movement of parts up a spiral trough at a rate of 28 ft per min with 1 sec between each indexing of the 14-station machine.

Built by Inter-Lakes Engineering Co., Detroit, the new Buick machine is a small parts automatic feeder that provides fast, single line feeding and oriented position for a list of parts ranging from springs, washers and screws to small fiber gaskets.

Eventually, Buick engineers predict, this single machine which combines a Syntron feeder, an electric eye counting device, and an ingeniously flexible box and envelop holding fixture, will be able to package more than 2000 small parts for Buick dealers. The machine has actually handled successfully more than 108 different parts since it was placed in service 3 months ago.

Among the obvious advantages of this highly versatile machine are: *(1) Accurate, rapid orienting, feeding and counting of a large range of steel, nonferrous metal, rubber and fiber parts; (2) adaptability to a wide range of shapes and sizes; (3) setup time of less than 3 min for most parts; (4) a wide range of packages, including both boxes and envelopes, may be used; (5) great reduction in labor needs; (6) high output per sq ft of floor space; (7) attractive white packages and envelopes remain unsoiled during the packaging process.* The machine occupies

LOADING CARTONS into the 14-station packaging machine. Electric eye counter and adjustable loading pipe show at left. Controls are under table in front of operator.



FILLING STATION of machine is at discharge end of loading pipe in background. Clips are adjustable to different sizes of cartons by means of single wrench which adjusts all 14 stations at once. Clips will also hold envelopes, the bottoms of which fit into slots in the turntable on which cartons rest in this photo.

20 sq ft of floor space and needs only one operator.

Recently a run of 53,000 flathead studs was counted accurately and packaged on this machine at a rate of more than three times the previous rate for hand packaging, without fatigue to the workers.

The operating principle of the Syntron parts feeder is well-known. Parts are caused to move to the outside rim of a circular hopper and to advance up a spiral trough or ramp by electromagnetic vibrations. The action is so gentle that even the most fragile parts are undamaged. The flow of parts through the machine can be interrupted at any time, permitting indexing of the machine or any adjustments that may be required. Movement of the parts starts immediately after the switch is thrown. All the operator has to do is to keep the machine supplied with parts and containers.

The convex bowl is so shaped that the parts are made to slide or roll easily toward the spiral trough. The type of feeder used at Buick is a many-purpose design. If desired, parts can be made to feed head first, face up or face down. But this has not been found necessary in the case of Buick parts.

Use Electric Eye Counter

The bowl is 24 in. in diam. Slope of the ramp is at a rate of ⅛ in. per ft. Width of the spiral feeding trough is 1⅜ in. Total length of the feeding spiral is approximately 14 ft.

Due to the shape of the bowl and the effect of the intermittent vibrations, parts move steadily up the ramp. At a distance of 7 in. from the counter, an adjustable baffle plate is set to permit only one part to pass at a time. Near the top of the trough, an adjustable brush is set to push off the ramp any part that may be on the top of another.

After passing the brush the parts pass over an electric eye counter and fall through a sectional metal tube into a packaging box or envelope. This tube can be adjusted to deliver the parts to the package at the proper height and angle. A special fan is provided to keep the electric eye free from dust particles.

The multiple-station dial indexing mechanism accommodates various size cartons and envelopes. The electronic counter may be adjusted to count from 1 to 999 pieces. In addition to the electronic counter, a time switch is provided to allow ample time between cycles of the machine if the parts can be counted more rapidly than cartons or envelopes can be unloaded on the machine.

Another convenience is a counter that totals the number of parts packaged during the day or during a single run. In this way it is possible to check the number of parts received from vendors.

When it is necessary to reset the machine to package another product the following simple adjustments are required:

(1) Regulate the position of the electric eye, particularly in case the piece is several inches long. The eye can also be set to count double—both edges of a large washer, for example.

(2) Set baffle plate to eliminate double feeding.

(3) Set the brush to eliminate parts that may be nested together.

(4) Reset rotating ring that automatically adjust all 14 stations to the package size.

DELIVERY END of loading ramp shows in this closeup. Bolt in foreground is passing under the electric eye counter before dropping into top of loading pipe.

(5) Adjust counter and time cycle switch.
(6) Press starter button.

Buick's machine will take parts of various shapes up to 3 in. long and ¾ in. diam. Washers as small as ¼x1/32 in. have been packaged with this machine as have 3/16 in. ball bearings.

Maximum span of the spring holders at this 14-station machine is 4 in. Envelopes up to 6 in. high can be used if desired.

The action of the machine is such that a single ball bearing, for example, can be placed in the machine and will be caused to move steadily up the ramp, pass over the electric eye and into a selected container. The operation can be stopped at anytime during the cycle and the ball bearing will hold its position on the feeding ramp.

NEW BOOKS

Economic Aspects of Atomic Power, prepared under the direction of S. H. Schurr and J. Marschak, is an exploratory study of peacetime applications of atomic power, and the first comprehensive approach to this important and controversial subject. The book presents an analytical study of the potential applicability of atomic power in several industries, with a chapter on iron and steel. An outline estimate of the economic effects is presented; an economic comparison is made for various areas of the world between electricity generated from atomic heat and that produced by other means. Princeton University Press, Princeton, N. J. $6.00. 290 p.

Mineral Industries Education, by E. Steidle, presents a philosophy of education as it affects the mineral arts and sciences and is divided into three principal parts: Roots of Human Progress; A Philosophy for Conservation; Wanted: Mineral Industries Colleges. As far as the records reveal this is the only book published on trends and objectives in mineral industries education. The study is provocative as a worthwhile attempt to review the records and prospects of one phase of land-grant college educational program. Mineral Industries Extension Services, State College, Pa. $3.00. 252 p.

Metals at High Temperatures, by F. H. Clark, is a compilation of the most recent data on the properties of metals at elevated temperatures. Designed primarily to cover heat resistant alloys and special alloy steels but including other metals such as aluminum, lead and magnesium alloys, the text is introduced by a theoretical discussion on the plasticity of metals, with special reference to high temperature effects. The book is intended for all who are concerned with the engineering and metallurgical aspects of high temperature service, particularly in reference to turbojet airplane engines where these alloys are playing a critical part. Reinhold Publishing Corp., 330 W. 42nd St., New York. $7.00. 372 p.

Manual of Instrument Transformers covers the theory of operation and application of instrument transformers, written for practicing engineers and students engaged in the fields of power generation, transmission and application where metering and relaying problems can be solved by the correct application of these units. Apparatus Dept., General Electric Co., Schenectady 5. $1.00. 74 p.

The Rolling of Metals, Theory and Experiment—Volume I, by L. R. Underwood, covers the fundamental aspects of the subject such as forward slip, friction between rolls and material, and friction hill theories of rolling and methods of calculation of the rolling load based upon them. Volume I records the extent of scientific development during the past generation and the resulting progress in the technique of rolling flat metals. Information is also given on calculation of specific roll pressure; roll flattening is also dealt with. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16. $6.50. 344 p.

Industrial Plant Location—Its Application to Zinc Smelting, by C. H. Cotterill. An integrated description of the zinc industry in the United States is utilized for the purpose of demonstrating a scientific approach to regionally locating industrial plants. Geographical differentials in cost and profit are demonstrated and a generalized procedure in locating plants is arrived at. C. H. Cotterill, 1600 Paul Brown Bldg., St. Louis 1. $5.00. 156 p.

The Properties of Metallic Materials at Low Temperatures, by P. L. Teed, is an introduction to the subject, including experiments on low-temperature changes in properties of aluminum, ferrous alloys, magnesium alloys, steels, copper, nickel, zinc, tin and lead. The book is in the form of a critical survey of a large number of experiments rather than a dissertation on formulas of thermodynamical origin; each chapter deals with a restricted aspect of this subject. John Wiley & Sons, Inc. 440 Fourth Ave., New York 16. $3.50. 222 p.

news of industry

Ore Fleet Waits Weather to Start Big 1951 Haul

Goal 90 million tons . . . Place Apr. 1 reserve stocks at 16,800,000 tons . . . Canadian fleet will once more boost ship capacity . . . Duluth reports 24 in. of ice —*By Bill Lloyd.*

Cleveland—With a near-record movement of 90-million tons of iron ore as a goal, iron ore shippers were watching the weather this week and standing by for what they hope will be one of the earliest openings of navigation in Great Lakes history.

Dwindling stockpiles at lower lake docks and furnace yards coupled with big demand, have prompted an early opening of navigation five times in recent years. Significantly, the earliest opening on record, Mar. 23, 1942, marked the start of the all-time record movement, 93,008,726 gross tons.

Trip capacity of the U. S. iron ore fleet is 2,617,750 tons at 20 ft draft. Summer loadings will increase this about 6 pct. To move 90-million tons the fleet will have to make an estimated 35 trips. The "normal" iron ore season starts Apr. 15 and ends Nov. 30, which is about a 225-day season. If most of the fleet starts by Mar. 28, the goal is definitely within reach.

Canada to Help

In addition, the Canadian fleet of 43 vessels is expected to be of some help, possibly from the start of the season. Legislation permitting this has already passed the Senate and is in the House where speedy action is expected. In 1950, these boats carried 5,800,000 tons, and about 5,000,000 tons in 1949.

Big question mark is Lake Superior. The U. S. Coast Guard cutter Mackinaw worked down to Green Bay, in Lake Michigan late last week and was scheduled to go into Escanaba to break out the harbor.

Reports from Duluth, however, mention 24 in. of ice in the harbor, zero temperatures at night and below freezing temperatures during the day, indicating a prolonged thaw is needed. With the opening of the Soo Canal to Duluth, Superior and Two Harbors, indefinite, it is doubtful ore from this area will be dumped before Apr. 15th.

Stocks Below Last Year

Iron ore stocks on hand at furnace yards and Lake Erie docks Mar. 1, totaled 24,123,000 gross tons. Assuming consumption of about 7,300,000 tons this month, stocks on hand Apr. 1, will probably total 16,800,000 gross tons. On Apr. 1, 1950, stocks on hand totaled 21-million tons.

Shippers have a battle on their hands. The 13 new ore boats ordered last fall will not be in service until the 1952 season. Cleveland Cliffs Iron Co. hopes to get its converted Liberty ship into operation by midsummer, which, with lengthening of Inland Steel Co.'s P.D. Block, will add about 12,000 tons to fleet capacity.

While the goal of shippers is 90 million tons, they will top it if possible. They'll need an early start, good weather until late fall,

Turn Page

Subcontract Orders

New York—Are you a small manufacturer with idle machine time spreading red ink across your books? Are you a prime contractor with headaches because you can't find a subcontractor for that tough part?

This week The Iron Age (pp. 92 and 93) introduces a new weekly editorial feature aimed at helping you with these problems. We'll publish photographs or suitable sketches of parts prime contractors want to subcontract, with a brief description of each. If you can make these parts, get in touch with the prime contractor.

Channel Deepening Hearing Held

Trenton, N. J.—Data on deepening the Delaware River channel to permit access by ocean-going ore boats to the new Fairless Works United States Steel Co. is building at Morrisville, N. J., was presented this week at a public hearing held by U. S. Army Engineers.

Deepening the channel from 25 ft to 35 ft would permit standard fully laden ocean ships to reach the new plant with ore from Venezuela and other foreign sources. Initial operation of the plant, starting 1952, would require 3,300,000 gross tons of coal and foreign iron ore annually.

First Ore from Venezuela Due

Sparrows Point—First shipment or iron ore from Venezuela was scheduled to arrive at Bethlehem Steel Co.'s mill here this week. Tonnage was not disclosed but ship capacity is 21,000 tons. The ore will become one of Venezuela's most important exports.

INDUSTRIAL SHORTS

Mill Modernized—A sheet mill modernization program for the Sheet Steel & Tin Plate Co., Ltd., of Piraeus, Greece, has been completed by the Lewis Foundry & Machine Div., of BLAW-KNOX CO., Pittsburgh. Improvements included installation of modern control equipment, conveyers, tables, doubles and walking beam furnaces.

Navy Contract — A Navy Dept. facilities contract for a full complement of machinery and equipment to produce military aircraft has been awarded TEXAS ENGINEERING & MFG. CO., INC., Dallas. Temco will purchase and install the equipment on a cost reimbursable basis. Some machines will be drawn from the JANMAT pool while others will be purchased new.

Early Start—Great Lakes ore shipping season is expected to get off to an early start this year. INLAND STEEL CO. officials stated it may be possible to get a ship into Port Inland, Mich., for a cargo of limestone at the end of this week and another into Escanaba, Mich., for ore.

Furniture Sale—The New Britain Machine Co., has sold its shop furniture division to the INDUSTRIAL BENCH & EQUIPMENT MFG. CO., New Britian, Conn. The sale includes all machinery, equipment, inventory and prints of this established line of shop furniture which New Britain initiated prior to World War I.

Kropp Subsidiary—Formation of KROPP FORGE ORDNANCE CO., wholly-owned subsidiary of Kropp Forge Co., has been completed. The company has been organized to operate the forge plant at Melvindale, Mich., which Kropp acquired last year from the Ordnance Tank Automotive Center of Detroit. The new firm has an authorized capitalization of $500,000, of which $100,000 has been issued.

Trailer Conversion — FRUEHAUF TRAILER CO., Detroit, will convert 800 truck trailers made for the Commercial Home Equipment Corp. to haul Lustron prefabricated homes. They will be changed over to commercial trailers with no loss anticipated by the company. It is reported that the firm's net earnings for 1950 would exceed $8.5 million.

Ammunition Booster — Initial orders for 50 cal. ammunition boosters for U. S. Army tanks totaling approximately a half-million dollars have been received by the AIRESEARCH MFG. CO., Los Angeles. The tank ammunition booster is the first application of AiResearch electrical equipment in a field other than aircraft.

Kaiser Acquisition — KAISER-FRAZER CORP. has purchased the Detroit engine division plant from Continental Motors Corp. The facilities will be converted for production of Wright R-1300 aircraft engines. Meanwhile, automobile engines will continue to be built. This aircraft engine is used in the T-28 advanced trainer built by North American.

Crystal Lake Site — Construction will start soon on a new factory and office building in Crystal Lake, Ill., to house the Diesel division of HARNISCHFEGER CORP. The factory, along with a smaller office structure, will occupy approximately 100,000 sq ft on an 80-acre site. Production is slated to start in October.

Plant Construction—The general construction contract for the new Chrysler tank plant in Newark, Del., has been awarded H. K. FERGUSON CO., INC., New York. The new plant comprises more than one million sq ft, with a manufacturing area of 600 x 1500 ft. There will be a two-story office building, a one-mile test track and other smaller buildings.

top work by dispatchers, and a minimum of cross-sailing, which is to Great Lake shippers what cross-hauling is to railroads.

The fleet is ready to go. A spokesman for Pittsburgh Steamship Co., U. S. Steel Corp.'s iron ore carrying subsidiary, said Pittsburgh plans to send two ships to Calcite, Mich., on Mar. 23, two on Mar. 24, and two on Mar. 25, weather permitting.

Bethlehem to Start Work On Pennsylvania Iron Ore Mine

New York—Shipment of iron ore from Bethlehem Steel Co.'s year-old discovery of deposits near Morgantown, Pa., 1500 to 3000 ft below surface, will begin in 2 or 3 years, said A. B. Homer, president. Work on sinking shafts through solid rock and construction of a beneficiation plant for concentration and pelletizing the magnetic type ore to 60 to 70 pct iron content will start shortly.

Pyrite from the ore will go to Bethlehem's Sparrows Point plant for conversion to sulphuric acid in a new plant. Favorable location of the new mine will facilitate shipments to Bethlehem's eastern plant by both rail and truck. A certificate of necessity has been issued.

To Report Alloy Meltings

Washington — Steel alloy producers have agreed to report all April meltings to the government. The National Production Authority is planning to use the resulting figures as a guide in setting up its forthcoming Controlled Materials Plan. (THE IRON AGE, Mar. 8, 1951, p. 15.)

Reports on April meltings will be used as a "dry run," NPA said. An order now being drafted will require monthly melt sheets to be filed 30 days in advance beginning with May 1 for June melt.

The melt sheets will ask amounts of such alloys as nickel, molybdenum, and other metals used in each combination of alloy steel to be produced.

Schedules are to be compiled by type of melt and product classification sections as follows: Elec-

tric furnace melting—E (1) ingots; E (2) blooms, billets, slabs, bars and rods; E (3) plate (rolled); E (4) sheet and strip; E (5) structural shapes; E (6) tubes; E (7) forgings (including forged plate section).

Openhearth furnace melting—B (8) ingots; B (9) blooms, billets, slabs, bars, and rods; B (10) plates (rolled); B (11) sheet and strip; B (12) structural shapes; B (13) tubes; B (14) forgings (including forged plate).

Allocation Plan for Rerollers on the Way

Inspired by shortages, the system will assure just distribution . . . Availability of rerollers depends on new rail output . . . Foundries snatch up supplies—*By Gene Beaudet.*

Chicago—Because of shortages, an allotment system is expected to be set up by the government for a more equitable distribution of rerolling rails. Domestic rerollers constituted about 60 pct of the raw materials consumed in 1950 by the industry. With a capacity of about 1 million tons of finished products annually, the industry came to within a little over 90 pct of reaching it last year.

The remaining 30 or so pct of finished products not produced from rerollers was filled in by using foreign rerollers, relaying rails, steel car axles and billets. Some sources estimate last year's imports ran as high as 100,000 tons.

Insurance of Supply

Historically, the tonnage of rerollers each year runs about 30 to 40 pct by weight of the annual production of new rail. During 1950, 1,705,000 tons of new rail were shipped. Production of new rail in 1951 is not expected to exceed that of last year.

Since availability of rerollers depends directly on new rail production, it can be seen why closer supervision of distribution is necessary to insure the industry an adequate supply. Greater use of rerollers also reduces the amount of billets it needs. The released billets can be used by other producers.

Faced with less raw materials, the rerolling industry will be called on to perform at a record rate. Over one-quarter of their reinforcing bar production of 1950 will be needed this year for the repair and construction of essential highways. And this is just one outlet. The atomic energy commission is said to be calling for enormous quantities of fence posts, with Army requirements for entanglement posts running a close second. There will also be a larger demand for carbon bar, fence posts, shapes, angles and various other products from farm implement and furniture makers, erectors of transmission and radio towers and other consumers.

The industry's procurement problems partly stem from heavy buying before the scrap regulation when a good deal of the rerollers were cut up and sold to foundries at high prices. The foundry competition caused many inventories to slip. In other instances producers were forced to buy relaying rails which cost considerably more and which sometimes were upgraded rerollers.

"You were warned plenty about parking in our loading zone."

With scrap controls, the situation was expected to improve but so far there has been little improvement. Although railroads are supposed to allocate all rerollers to the industry, they have been slow about it. Some mills have received no allocations since the scrap regulations were imposed.

Others object to the specifications on rerollers calling for a minimum of 5 ft in length and think they should be set at 8 ft for the most desirable production. Those under 8 ft should be classed as scrap rail. Relayers do not come under the pricing regulations, and it is reported that they are still being sold to producers for as much as $20 per ton over rerollers. Improper grading specifications are still pushing rerollers into the relaying class.

With allocations, grading specifications will be overhauled to insure the flow of a greater amount of rerollers to the rerolling industry.

Seek More Oil with Less Steel

Washington—A four-point program to increase gas and oil yields with minimum use of steel has been announced by the Petroleum Administration for Defense.

The program, announced by Interior Secretary Chapman and approved by several states, would reduce the number of wells per square mile, increase the use of pressure to maintain production, coordinate field practices to cut use of large diameter pipe, and encourage tapping of two or more petroleum reservoirs with one well-bore.

Woodward Getting New Coke Ovens

Pittsburgh—Koppers Co., Inc., will construct a battery of 30 chemical recovery coke ovens at the Woodward, Ala., plant of Woodward Iron Co., which now operates four batteries consisting of 226 Koppers ovens. The new ovens will have a daily carbonizing capacity of 480 tons of coal.

BITS AND BRIEFS

By Bill Packard

No wonder taxes are soaring like flying saucers. With bootlegging booming again, gamblers shunning racetracks and claiming losses larger than winnings, it's getting harder and harder for the government to collect an honest dollar . . . **Five United States companies now reaching toward Venezuela for iron ore are U. S. Steel, Bethlehem, Republic, Jones & Laughlin, and M. A. Hanna** . . . A. G. Decker, vice-president, turned first dirt for Black & Decker's new electric tool plant at Hampstead, Md., to be built by Austin Co. . . . **Timken's three new electric furnaces to be equipped with new induction stirring devices which speed chemical reaction in melting and improve quality of alloy steel** . . . TV viewers the other afternoon thought the headless horseman of Sleepy Hollow had come to life on the witness stand at Senate crime investigation. Imagine their chagrin when they discovered it was only Frank Costello—too modest to be photographed . . . **Colorado Fuel & Iron changing name of Worth Steel to Claymont Steel Corp. after completing purchase from Worth family. Other moves by CF&I expected in the East** . . . General Motors' report explaining their annual report makes interesting reading. Another fresh idea by same firm—distributing to employees booklet called "6 New Ideas for Thrifty Use of Meat." We're taking our copy home . . . Link Belt distributing reference aid aimed at simplifying problems of designing conveyor systems, mechanical power transmission and processing machinery. Eight pound catalog has 1296 pages, 1673 tables and charts of basic data . . . **DO's, like dollars, losing their value because there are too many of them around** . . . Glenn L. Martin reoccupying No. 2 Army plant in Baltimore because of recent big orders. Work force to be boosted by 5000 . . . Chairman John Marshall reveals plan to split Granite City stock 2 for 1, triple number of shares, and change from no par to $12.50 par value . . . Ford, Bacon & Davis nearing completion of engineering report on Allegheny Ludlum and Pittsburgh Steel. Report to be used in merger negotiations which are proceeding . . . Navy ready to let first contract under new $2.3 billion shipbuilding and conversion program. Includes are 140 new and 292 converted vessels, plus super-carrier able to accommodate atom bomb carrying planes.

More Plate Means Less Sheet Production

Burden will be heavier with NPA's goal of 700,000 tons of plate a month . . . Will divert sheet from already-stung civilian producers . . . Shift to plates listed—*By John Delaney*

Pittsburgh — National Production Authority's decision to press for a monthly plate production of 700,000 tons means that strip sheet mills must assume an even heavier burden for plate requirements.

How much heavier is debatable. NPA admits it is flying by the seat of its pants on plates. No one seems to know precisely what the plate mill capacity of the country is today.

The last tabulation by American Iron & Steel Institute gave plate mill capacity as of Jan. 1, 1948 as 7,182,700 tons, of which 5,811,400 tons was sheared, and 1,371,300 tons universal. Capacity probably has risen some since.

Modernize Plate Mills

For example, Sheffield Steel Corp. last year installed a new 130-in. 4-high reversing plate mill, and modernized its 100-in. and 110-in. mills. U. S. Steel Co. modernized its 96-in. plate mill at South Chicago in 1949.

If NPA's goal is to be realized, however, non-essential consumers of sheets are due for another blow, since strip sheet mills will be called upon to make up the deficit between plate mill capacity and the 8.4 million ton annual production rate being sought.

Hot-rolled sheet producers are now setting aside approximately 108,000 tons of sheets per month for defense. In addition, they must provide certain tonnages to warehouses and to non-integrated producers, and already are rolling plates for the various programs. Some of these mills say they now have very little left for non-essential consumers. An increase in plate tonnage will mean that much less.

Needed for All Demand

NPA said the monthly production of 700,000 tons will be needed if all plate requirements are to be met—that is, defense and defense-supporting programs, and civilian. Plate shipments of all types last month were 630,590 tons.

During World War II, plate production of all types—carbon, alloy, and armor plate—reached a peak of 1,280,000 tons per month early in 1945. This was at an annual rate of 15,360,000 tons, compared with a potential capacity of 17,841,320 tons. This potential figure was an estimate of the tonnage that could be rolled on all available plate and sheet mills in that year.

It is believed that if all mills capable of rolling plates today were converted, potential plate capacity in the country would be in excess of the war-time potential.

Unless we embark on a big shipbuilding program, it isn't likely that requirements will be anywhere near war-time needs. The present cargo ship program, for instance, calls for about 25, compared to the letting of 100 to 200 such ships at one crack during the war.

Timken Plans Shift to More Alloy with $5.5 Million Growth

To install three electric furnaces with Swedish inductive stirrers.

Canton, Ohio—Timken Roller Bearing Co. will spend $5,503,000 in expanding both melting and fabricating facilities. Total ingot capacity will be boosted 14 pct, while electric furnace capacity will increase 80 pct. The emphasis will be on more special electric furnace alloy steels.

Rearrangement of the No. 2 mill to incorporate a tube elongator, rotary sizing mill, a reheating furnace and equipment will cost $1,450,000. With these facilities the Canton tube mill will be able to handle larger diameter tubes and increase tonnage going through the mill by roughly 20 pct.

Swedish Inductive Stirrer

About $434,000 will go to a new cold tube reducing machine for the Cambrinus tube mill. It will raise tonnage of high alloy and stainless steel light wall tubing. A 160-ft controlled atmosphere roller hearth furnace for annealing high alloy and stainless steels will cost about $122,000.

An innovation for American steelmaking will be an inductive stirrer for the electric furnaces. Originating in Sweden, the stirrer speeds up chemical reaction in the melting charge, improves quality, and reduces manpower needs.

February Steel Output a Record

New York — February production of steel was 7,762,000, a record for the month and a million tons greater than February last year. Output in the first 2 months topped 16.6 million tons, more than 1.9 million tons greater than in the 1950 period.

TCI Schedule Back to Normal

Birmingham — Tennessee Coal, Iron & Railroad operations are back on schedule after the return of 3000 coal miners to the pits after a 10-day strike. Ore miners had also been out.

RING IN THE NEW: New officers of the American Society of Tool Engineers are: W. A. Thomas, Ford Motor Co. of Canada, secretary; H. C. McMillen, Seeger Refrigerator Co., treasurer; L. B. Bellamy, Detroit branch Stirling Grinding Wheel Co., first vice-president; J. J. Demuth, Sligo, Inc., president; T. J. Donovan, Donovan Co., vice-president; and Herbert L. Tigges, Baker Bros., retiring vice-president.

ASTE Meeting Hits Subjects Close to Defense

Focus is on means to hike output, improve quality, save materials, manpower . . . Engineers meet with military procurement men . . . Major paper is on carbide tools—*By George Elwers.*

New York — Production men swapped technical information at the 19th annual meeting of the American Society of Tool Engineers, held here on Mar. 14 through 17. Technical papers stressed methods of increasing output, improving quality, and saving materials and manpower—all of which have heavy importance in the defense effort.

The meeting featured an Armed Services-Industry conference. Tool engineers and military procurement officers paved the way to cooperation.

Paper on Carbide Tools

Among the major technical papers was one on use of carbide tools by W. R. Coomey, Rice Barton Corp. Mr. Coomey reported on machining tests indicating that proper use of carbides will yield higher production rates.

Productivity of older machine tools which cannot utilize the superior cutting properties of carbides can also be increased, said Dr. W. R. Frazer, Union Twist Drill Co. He described new grades of high-speed steel containing quantities of carbides which permit increased production.

A new pressworking process that can save up to 15 pct of scarce sheet steel was described by Melvin and Dan Verson, Verson Allsteel Press Co. Transfer devices, they said, eliminate conventional scrap strip by enabling presses to use nearly all the material fed them.

Manpower Savers

Machines which control themselves were discussed by J. M. Delfs, General Electric Corp., as answers to the growing manpower shortage. Automatic machine control devices also up production per machine and improve quality, Mr. Delfs said. Another paper on mechanical and electrical control devices, for counting, measuring, and sorting, was read by A. C. Sanford, Federal Products Corp.

Other important papers discussed: A rational approach to the specification of tolerances; optimum use of mechanical presses; carbide tool selection procedure; ultrasonic inspection developments; plant layout for complicated precision manufacture; steel machinability measurement; plunge grinding; and use of multiple-thread gear hobs.

SUBCONTRACTORS WANTED

New firms, new products bring demand for thousands of subcontractors on billions in defense orders.

For the prime contractor this service is designed to bring inquiries from potential subcontractors who can see at a glance whether or not they are qualified to bid on the parts illustrated and described.

For the subcontractor it should prove a source of new defense business. By listing the tolerances and specifications that must be met, the would-be subcontractor can save time: He will know the requirements he must meet and so avoid time-consuming correspondence over these key details.

Frankly, this new feature is an experiment. The number of items listed each week will be increased substantially (within space limitations) if prime contractors find it worthwhile. This means that if you need subcontractors you should list—as a starter—one or two of the parts you want to subcontract. The form for this listing—which should be accompanied by a photo or a sketch (see p. 93)—is shown on this page. If you don't have a photo or a suitable sketch THE IRON AGE will have one made at cost ($10.00 to $15.00). Otherwise there is no charge for this service.

To prime contractors:

If you are having trouble lining up potential subcontractors quickly; if you have hard-to-place parts; if you are swamped with facilities lists this service should help you. To take advantage of it you need only send us the data shown on this form and wire us as soon as all contracts are let on any item.

Part number: *(Your part number)*

Material and fabrication: *(i.e. SAE 4130 forging, heat treatment, etc.)*

Approximate maximum length or diameter:

Specifications: *(i.e. AN-QQ-A-376 if necessary.)*

Tolerances: *(Maximum allowable tolerances on dimensions, concentricity, finish, etc.*

Quantity required:

Address: *(Of prime contractor, name of purchasing agent, etc.)*

Be sure to enclose a photograph or simple inked sketch of the part.

Mail to:

"CAN YOU MAKE IT?" EDITOR,
THE IRON AGE,
100 EAST 42ND ST.,
NEW YORK 17, N. Y.

If you want subcontracts:

As the defense effort gathers momentum there will be thousands of subcontractors required on literally billions of dollars worth of government orders. Check the parts shown on the opposite page. Each item shows whom to write to if you are interested. This will be a weekly feature if prime and subcontractors show they want it.

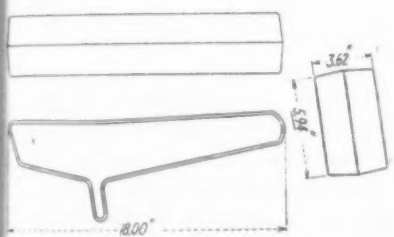
If you are new at subcontracting, here are two tips: (1) *Don't try to take on any part that you can't handle as to tolerances, heat treatment, etc.* (2) *When writing to prime contractors give a little of the background of your company, financial details, peacetime products, etc.,—anything brief you feel will help the prime contractor size you up.*

This service is not intended to permit you to bid directly on the parts listed. It does show parts wanted and operations to be performed on them, plus tolerances and other requirements that must be met. Then, if you can do the job and want it, write to the prime contractor named in each item for complete details permitting you to submit a quotation. Please address your inquiries directly to the company concerned, not to THE IRON AGE.

CAN YOU MAKE IT?

A New Iron Age Service to bring prime contractors and subcontractors together on military orders.

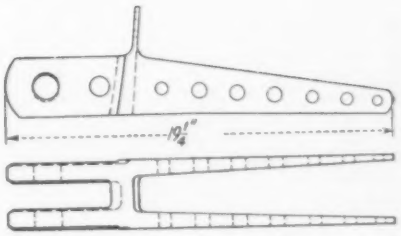
Iron Age No. SC 1 (above)
Machine from AMS 6220 forging, normalized involute spline. Max. diam: 4 1/3 in.
Carburized and hardened.
Finish: 16-32-80 microinches.
Tolerances: 0.004 to 0.010 in.
Requirements: 240 to 550 per month.
Part No. 130683, Subcontracting Dept., Wright Aeronautical Corp., Wood-Ridge, N. J.



Iron Age SC 2 (above)
Die Forging, AMS 4340 steel.
Spec: AN-QQ-S-755.
Hardness: 255 Brinell max.
Normalize and anneal; sandblast and Magnaflux.
Tolerances: 0 to 0.06 in.
Quantity: 20; plus 20 similar parts.
Part No. 85-124-33, H. A. Hoffmann, Jr., PA, East Coast Aeronautics, Inc., 896 So. Columbus Ave., Mt. Vernon, N. Y.

Iron Age SC 3 (below)
Machine from aluminum alloy casting.
Max. length: 7 in.
Heat treat after machining.
Pressure test after machining.
Finish: 20-40-80 microinches.
Tolerances: 0.001 to 0.010 in.
Requirements: 240 to 550 per month.
Part No. 130314-N-1, Subcontracting Dept., Wright Aeronautical Corp., Wood-Ridge, N. J.

Iron Age SC 4 (below)
Machine AMS 6322 forging.
Max. diam: 6¾ in.
Hardness: RC26-32.
Concentricity: 0.002 in.
Finish: 16-20-32-50 microinches.
Tolerances: 0.002 to 0.010 in.
Requirements: 240 to 550 per month.
Part No. 132311. Subcontracting Dept., Wright Aeronautical Corp., Wood-Ridge, N. J.



Iron Age SC 5 (above)
Machine from AMS 4340 die forging.
Heat treat to 170,000-190,000 psi per AN-QQ-H-201; RC 39-42.
Magnaflux per AN-I-32.
Finish: all mach. surfaces to 100 microinches.
Tolerances: 0.0024 to 0.010 in.
Quantity: 20, plus 20 similar parts.
Part No. 85-124-02, H. A. Hoffmann, Jr., PA, East Coast Aeronautics, Inc., 896 So. Columbus Ave., Mt. Vernon, N. Y.

Iron Age SC 6 (above)
Machine from aluminum bronze—AMS 4640 forging.
Max. diam. 5½ in.
Finish: 32-60-80 Microinches.
Tolerances: 0.002 to 0.010 in.: broached holes, 0.002 in. concentricity.
Requirements: 240 to 550 per month.
Part No. 135243, Subcontracting Dept., Wright Aeronautical Corp., Wood-Ridge, N. J.

CONTROLS DIGEST

Allocation Set for Columbium, Tantalum; Use in Stainless Lower

Washington — Columbium, tantalum, and their ferroalloys have been placed under allocation and the amount of these metals which may be used in stainless steel has been reduced.

Only purchasers of 10 lb per month or less of columbium and tantalum are exempt from the M-49 allocation order. Under amended M-3, the amount of these metals permitted in making stainless steels is cut from 10 times the carbon content of such steels to 8 times.

Products covered by M-49 include ferrocolumbium, ferrotantalum, ferrocolumbium-tantalum, and columbium-stabilized steels (mill products and castings).

Scrap bearing columbium and tantalum and their alloys are exempt from the order if the scrap is suitable for remelting in production of steel-bearing columbium and tantalum.

Named NPA Consultant

Lorain, Ohio—Myron B. Garber, sales director, Thew Shovel Co., has been named consultant with the National Production Authority. He served during World War II as director of the construction machinery division of War Production Board.

Defense Contracts to Metalworking Industry

Selected Contracts, Week of Mar. 19, 1951

Item	Company
Truck, fire	Central Fire Truck Corp., St. Louis
Truck, fire	Minnesota Fire Equipment Co., Lindstrom, Minn.
Trailers	Trailmobile Co., Cincinnati
Electric hoists	The Yale & Towne Mfg. Co., Phila. Div., Philadelphia
Radiosonde	Bendix Aviation Corp., Baltimore
Drying tumblers	Hammond Laundry Cleaning Machinery Co., Waco, Tex.
Electronic repair kits	Allied Radio Corp., Chicago
Truck tractor	International Harvester Co., Washington
Fans, electric	Westinghouse Electric Corp., Philadelphia
Pump ass'y	Pesco Products Div., Borg Warner Corp., Cleveland
Pump hydraulic	N. Y. Air Brake Co., New York
Regulators, oxygen	Bendix Aviation Corp., Teterboro, N. J.
Tractors	International Harvester, Melrose Pk., Ill.
Pumps	Chicago Pneumatic Tool Co., Chicago
Generator sets	Homelite Corp., Port Chester, N. Y.
Accelerometers	Engineering Research Associates, Inc., St. Paul
Lathes	American Tool Works Co., Cincinnati
Aircraft parts	Solar Aircraft Co., San Diego, Calif.
Engine parts	Allison Div., GM, Indianapolis, Ind.
Trainers	Curtiss-Wright Propeller, Caldwell, N. J.
Power units	Buda Co., Harvey, Ill.
Boosters	Steel Products Engineering Co., Springfield, Ohio
Trainers	Link Aviation, Inc., Binghamton, N. Y.
Power plants	Fairchild Engine Div., Fairchild Engine & Airplane Corp., Farmingdale, L. I., N. Y.
Assemblies	Fairchild Aircraft Div., Hagerstown, Md.
Carburetors	Bendix Products Div., Bendix Aviation Corp., South Bend
Gages	Kollsman Instrument Div., Elmhurst, N. Y.
Gages	American Machine & Metals, Inc., Sellersville, Pa.
Indicators	Aviation Engineering Corp., Woodside, L. I., N. Y.
Indicators	General Electric Co., Schenectady
Generators	Jack & Heintz Precision Industries, Cleveland
Parts for trainers	Curtiss-Wright Propeller, Caldwell, N. J.
Compressors, fire control	Cornelius Co., New Brighton, Minn.
Components, automatic pilot	Westinghouse Electric Corp., Dayton, Ohio
Indicator	Sperry Gyroscope Co., Great Neck, N. Y.
Electrical equipment	Conn. Tel. and Tel. Corp., Meridan, Conn.
Engine Assembly	Clark Equipment Co., Battle Creek, Mich.
Generator	GMC United Motors Service Div., Detroit 2, Mich.
Semi-trailer	Highway Trailer Co., Edgerton, Wis.
Semi-trailers	Fruehauf Trailer Co., Detroit
Hub, fan ass'y	National Farm Machinery Corp., Inc., Bellevue, Ohio
Compressor pump parts	Gardner-Denver Co., Quincy, Ill.
Cars and trucks	Ford Motor Co., Washington
Pump parts	M. T. Davidson Co., Beacon, N. Y.
Dishwashing machine	Gresham & Co., Inc., Kansas City

Industry Controls This Week:

NPA Orders

M-3, Alloy steels—Cuts use of columbium and tantalum in steels, and limits use of steels containing these alloys. Effective Mar. 15.

M-6, Steel for warehouses—Producers must allot and ship each month not less than 85 pct of warehouse's base tonnage of carbon steel products.

M-19, Cadmium use — Non-defense use of cadmium, including pigments for luminescent and other inks and paints is broadened. Restricts manufacturers' use to 40 pct of average monthly use during base period Jan. to June 1950. Effective at once.

M-49, Columbium, tantalum—These metals and their ferroalloys are placed on allocation. Effective Apr. 1.

OPS Orders

SR-13, Coke and fuel prices—Permits producers to adjust prices for increased delivered costs, principally bituminous coal.

NPA to Give Another Boost To Tin Cans for Perishable Foods

Washington — Following up its amendment of M-8 permitting a second quarter increase in tin for tin and terneplate production, NPA has taken further steps to assure tin cans for perishable foods.

Another increase of about 12 pct will be permitted in allotment of tin for tinplate manufacturers —for the second quarter only. This is made possible, NPA said, by not including tinplate export quotas under the 95 pct limitations the amendment allows.

Canners of perishable foods are to be given preference in delivery of can orders over other users. Also beginning with the second quarter, tin cans for less essential products will be increasingly curtailed.

Set Warehouse Allotments

Washington — The NPA has amended M-6, effective Mar. 15, to require steel producers to allot and ship each month not less than 85 pct of a warehouse's base tonnage of carbon steel products.

This will include rated orders the distributors place.

Fast Tax Write-Off Granted On 313 New Industrial Projects

DPA issues certificates of necessity to 231 companies — $1,183,424,159.

Washington—Fast tax write-off for 313 projects valued at $1,183,424,159 has been approved by the Defense Production Administration with granting of certificates of necessity to 231 companies between Jan. 25 and Mar. 7.

Added to the $1½ billion in certificates issued by the National Security Resources Board between Oct. 30, 1950, through Jan. 24, fast tax write-off has been granted for projects valued at more than $2.6 billion.

The expansion projects are opening a wide new field of potential business for contractors, builders, equipment makers, toolmakers and manufacturers seeking subcontract business.

Average individual tax write-off certification is 74 pct, with the percentage based on relation to the defense effort. Facilities for making military specialty items usually receive a higher rate of tax write-off than those for making products which would be marketable after the emergency.

Name of Company	Product or use	Amount Certified
Chicago & Eastern Ill., R.R.	Railway transportation	$581,964
Chicago Heights Terminal Transfer	Railway transportation	$290,982
Chicago Heights Terminal Transfer	Railway transportation	$450,000
Atwood-Vacuum Machine Co.	Aircraft parts	$1,500,000
Lehigh Valley R.R.	Railway transportation	$76,249
Diecraft	Tools, dies, jigs	$422,599
Lehigh Portland Cement Co.	Portland cement	$11,062,290
Boston & Maine R.R.	Railway transportation	$2,916,880
Waldorf Instrument Co.	Aircraft parts	$160,000
Waldorf Instrument Co.	Aircraft parts	$59,423
Chesapeake & Ohio R.R.	Railway transportation	$66,422,000
Ohio River Co.	Steel barges	$1,458,622
Ohio River Co.	Tow boats	$400,000
Chicago & Great Western R.R.	Railway transportation	$1,757,624
Wheeling Bronze Castings Co.	Pistons, bearings	$20,544
Levington Shipbuilding Co.	Petroleum barges	$580,000
Waste Material Corp.	Scrap iron	$14,480
Armour & Co.	Chemicals	$1,975,500
A. L. Mechling Barge Lines	Transportation	$138,000
Skirvin Tool & Engineering Co.	Assemblies, aircraft	$129,500
Gulf, Mobile & Ohio R.R.	Freight cars, locomotives	$14,550,241
Calaveras Cement Co.	Portland cement	$2,235,106
Armco Steel Corp.	Iron ore	$1,500,000
Chicago, Rock Island & Pacific R.R.	Railway transportation	$23,700,000
Harbor Tug and Barge	Transportation	$75,000
John I. Hay Co.	Transportation	$505,000
Detroit Steel Corp.	Carlion, sheet and steel	$47,797,100
Hufford Machine Works	Aircraft parts	$204,184
Macon Iron and Paper	Paper, steel scrap	$38,000
Spokane International	Railway transportation	$160,129
Harbor Tug and Barge	Tow boat	$75,000
Upper Mississippi Towing Co.	Barge	$962,597
Wilson Transit Co.	Transportation, ore	$533,687
Chesapeake & Ohio R.R. Co.	Track line	$3,501,600
Capital City Machine	Aircraft supplies	$13,710
Ace Steel Baling, Inc.	Scrap iron	$41,245
Defoe Shipbuilding Co.	Transportation, ore	$61,270
Heintz Mfg. Co.	Aircraft parts	$694,800
Burgess Norton Mfg. Co.	Tank parts	$98,000
Burgess Norton Mfg. Co.	Tank parts	$206,975
Burgess Norton Mfg. Co.	Tank parts	$388,000
Reiss Steamship Co.	Transportation, ore	$365,000
Lakeside & Marblehead R.R.	Transportation	$98,182
Marine Transit Co.	Barge	$384,515
Marvel Schebler Products Div.	Aircraft parts	$796,112
Pesco Products Div. Borg-Warner Co.	Aircraft accessories	$996,078
Goldberg Iron & Steel	Scrap iron	$215,000
Lehigh Valley R.R. Co.	Railroad transportation	$1,377,782
W. S. Moore Co.	Iron ore	$175,000
Seaboard Airline R.R. Co.	Transportation	$16,786,401
Seaboard Airline R.R. Co.	Transportation	$9,593,916
Commercial Metals	Scrap iron	$130,601
Hutchinson Pipe & Waste	Scrap iron	$148,914
Ohio Ferro Alloys Corp.	Ferro, silica manganese	$1,700,000
DeBardeleben Coal Corp.	Coal transportation	$850,000
Hillman Transportation Co.	Barge	$900,000
Steel Briquette, Corp.	Steel scrap	$35,000
The Trane Co.	Al. heat transfer service	$409,756
Consolidated-Vultee	Airplanes	$139,600
Consolidated-Vultee	Airplane parts	$1,511,838
Super Service Motor Freight Co.	Truck transportation	$470,000
Continental Steel Corp.	Steel ingots and sheets	$5,302,000
Aero Supply Mfg. Co.	Aircraft hardware, parts	$118,000
Learner Co.	Scrap iron	$90,500
National Steel Corp.	Pig iron	$1,352,000
Interlake Steamship Co.	Ore transportation	$6,000,000
Boeing Aircraft Co.	Engineering	$1,405,000
Southern R.R. Co.	Transportation	$10,250,000
Globe Iron Co.	Pig iron	$451,500
Goodyear Tire & Rubber Co.	Aircraft parts	$32,978
Ideal Cement Co.	Portland cement	$9,896,554
Marlin Rockwell Corp.	Aircraft parts	$1,104,965
Aircraft Eng. Products	Aircraft parts	$52,464
Metalcraft Mfg. Co.	Tools, dies	$92,894
Holub Iron & Steel	Scrap steel	$117,282

Turn Page

FINAL CHECKING AFTER INSPECTION—*Gloved so that her bare hands never touch a single ball, this checker turns the balls with the white card under special lighting that instantly reflects the slightest imperfection. Notice how alert she is to the seriousness of her responsibility.*

Our service men must have the *Best* of Everything

That is what they are used to. That is what their forefathers fought for and that is why their sons are so gallant today. Here, we are used to lots of nice things . . . the best in all the world.

They know—our men in foreign lands—what America *really* is. By comparison with conditions here, they are sure, positively so—there's no other place like home.

Here in America, we've labored under the glow of midnight oil for the best in everything, always.

From the best covered wagon and pony express, to the ultra-modern streamlined air-conditioned train, and five hundred mile an hour air express, Americans are leaders. Not followers.

To help keep the moving parts of our service men's tanks, planes, half tracks, trucks and all other machines smoothly rolling, millions of precision balls are made in this modern ball plant. Universal Balls have been used by the largest, most meticulous bearing manufacturers in the U. S. A. and abroad since 1942.

The best of everything must go to our service men. Specify Universal Balls.

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PRECISION BALLS OF CHROME AND STAINLESS STEEL, BRONZE AND SPECIAL METALS.

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KEYSTONE MUSIC Spring Wire

The uniformity of Keystone Music Spring Wire simplifies production problems in the manufacture of intricate springs and parts . . . assures end products of the highest quality.

The structural soundness and uniformity of this quality wire is attained by careful selection of raw materials, slow and meticulous processing and constant examination throughout its manufacture. Rigid final inspections include coiling, torsion and bend tests assuring the right quality to meet your exacting requirements.

If your products require any type of "special" steel wire, please consult us.

KEYSTONE STEEL & WIRE CO.

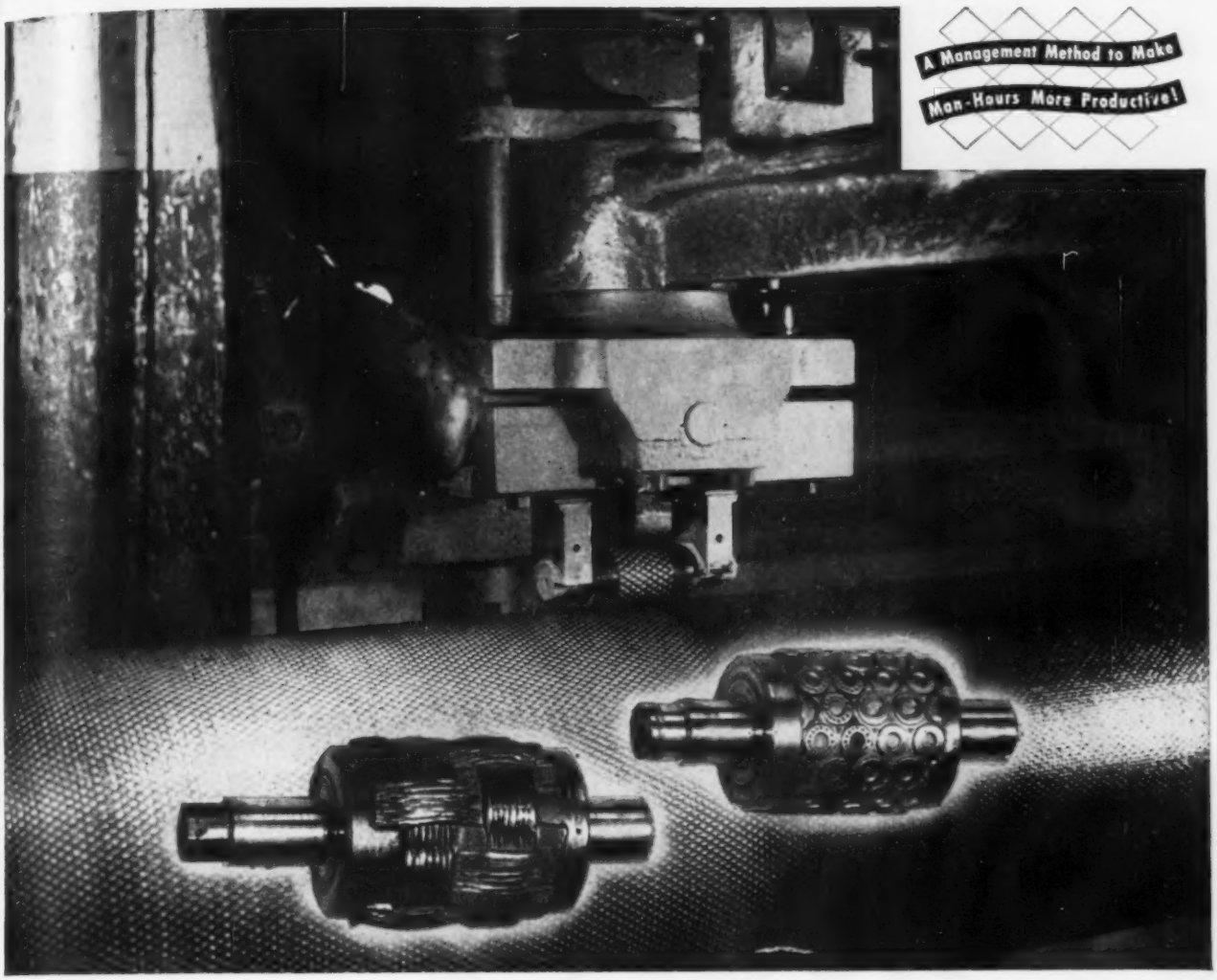
SPECIAL ANALYSIS WIRE. SETTING NEW STANDARDS OF PERFORMANCE

PEORIA ILLINOIS

• News of Industry •

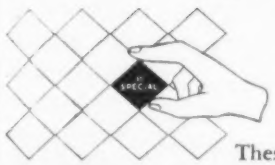
Name of Company	Product or Use	Amount Certified
National Lead Co.	Iron ore concentrate	$475,138
Aerojet Eng. Co.	Ordnance supplies	$611,000
Nordberg Mfg. Co.	Diesel engines	$3,694,402
Nordberg Mfg. Co.	Engine components	$1,076,887
Columbia Transportation Co.	Ore transportation	$12,000,000
Marine Transit Co.	Towing	$900,000
Universal Cyclops Steel	Steel forms	$629,000
Universal Cyclops Steel	Steel ingots	$2,366,000
Carolina Giant Cement Co.	Portland, masonry cement	$4,671,310
Seaboard Airline R.R. Co.	Transportation	$1,015,000
Petco Corp.	Fuel oil and gasoline	$1,936,000
Georgia, Florida & Alabama R.R. Co.	Transportation	$72,000
Seaboard Airline R.R. Co.	Transportation	$319,000
Seaboard Airline R.R. Co.	Transportation	$2,869,142
National Steel Corp.	Pig iron	$1,172,000
Great Lakes Steel Corp.	Steel products	$650,600
Hanna Furnace Corp.	Pig iron	$175,000
Great Lakes Steel Corp.	Coke	$2,062,700
Sharon Steel Corp.	Scrap steel	$190,600
Seaboard Airline R.R. Co.	Transportation	$3,705,077
Kaiser Steel Corp.	Iron ore, pig iron, steel	$15,475,527
Permanente Cement Co.	Portland cement	$3,422,000
Keystone Steel & Wire Co.	Steel wire	$295,000
Rotary Electric Steel Co.	Steel bars	$1,605,000
Goodyear Corp.	Fuel tanks	$216,694
Rotary Electric Steel Co.	Steel ingots	$450,000
Air Research Mfg. Co.	Aircraft parts	$1,959,728
Air Research Mfg. Co.	Aircraft parts	$608,777
Pueblo Steel Corp.	Seamless, merchant pipe	$80,000,000
Henry Fligeltaub	Scrap metal	$41,000
Rohr Aircraft Co.	Aircraft parts	$83,887
Lapointe Machine Tool	Broaching machine tools	$1,399,064
Republic Steel Corp.	Steel ingots	$386,000
Atlantic Steel & Iron	Scrap iron	$20,839
Olin Industries, Inc.	Ordnance material	$1,015,315
Granite City Steel Co.	Ingots, rolled steel	$3,640,000
Wallingford Steel Co.	Cold rolled steel	$115,000
Oregon Steel Mills	Steel ingots, bars	$245,865
Bethlehem Steel Co.	Pig iron, steel ingots	$2,231,000
Bethlehem Steel Co.	Pig iron and steel ingots	$28,386,000
Bethlehem Steel Co.	Bolts, nuts, rivets	$1,193,000
Bethlehem Steel Co.	Steel ingots, bolts	$136,000
Bethlehem Steel Co.	Fabricated steel	$66,000
Bethlehem Steel Co.	Fabricated steel	$65,000
Bethlehem Steel Co.	Fabricated steel	$1,409,000
Bethlehem Steel Co.	Pyrites and iron ore	$77,000
Bethlehem Steel Co.	Transportation	$853,000
Bethlehem Steel Co.	Transportation	$6,250,000
Bethlehem Steel Co.	Molds, steel products	$3,586,000
Bethlehem Cub Iron Mines	Pyrites, iron ore	$34,343,000
Bethlehem Cuba Iron Mines	Pyrites, iron ore	$4,037,000
Bethlehem Steel Co.	Transportation	$12,000,000

Turn Page



A Management Method to Make Man-Hours More Productive!

How to Put Delicate Patterns Through a 5-Ton "Wringer", Successfully



These knurling mills, made from No. 11 Special (Water-Hard) Tool Steel, press artistic patterns into large steel rolls for embossing cloth, paper and plastic. Here's what was required of the tool steel: It had to be hard enough to prevent upsetting; tough enough to prevent delicate edges from breaking under operating pressures up to 5 tons. Patterns on the mills were quite fragile and sections as deep as 1/16" could not collapse. Further, the steel had to heat treat with very little warpage.

But picking the proper steel wasn't as tough as you may imagine. For the Carpenter Matched Set Method not only indicated the one *best* steel for the job but enabled production management to "call its shots" . . . have the mills produce the required number of patterns on schedule, with less costly downtime.

For any plant making or using tools and dies, the Matched Set Method offers even more advantages than simplified selection. You benefit from lower tool steel inventories, heat treating economies, simplified toolroom and production procedures. To discover how it can work for you in your plant, write for the new booklet "How to Get Better Tool and Die Performance". THE CARPENTER STEEL CO., 121 W. Bern St., Reading, Pa.

Export Department: Carpenter Steel Co., Reading, Pa.—"CARSTEELCO"

Carpenter

MATCHED TOOL & DIE STEELS

More than top-grade steels . . . a Method to keep tooling and production on schedule!

For your convenience, Carpenter carries warehouse stocks in principal cities throughout the country

heavy-cut *Reamers*

FOR GREATER STOCK REMOVAL—ROUGHING, SEMI-FINISHING, FINISHING

QUALITY REAMED HOLES *Plus* LOW MAINTENANCE, OPERATING COST

This new design offers greater end-cutting strength and blade support. Blade mounting provides cutting rigidity equivalent to solid flute design, plus extended life through replaceable blades.

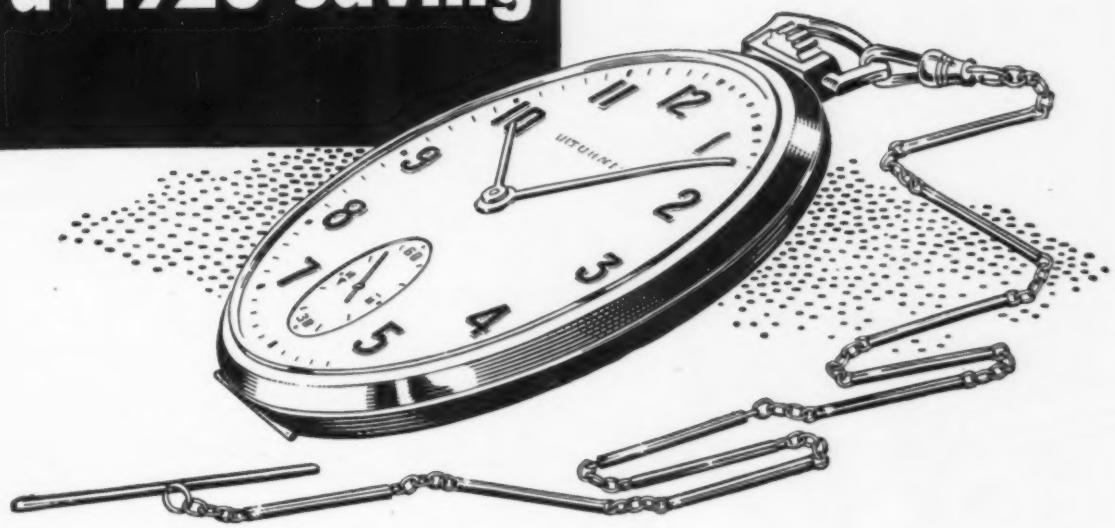
AVAILABLE FROM STOCK FOR IMMEDIATE SERVICE

BARBER-COLMAN COMPANY
593 ROCK STREET
ROCKFORD, ILLINOIS

Name of Company	Product or use	Amount Certified
Youngstown Sheet & Tube Co.	Buttweld pipe	$7,800,000
Youngstown Sheet & Tube Co.	Steel slabs, blooms	$4,489,000
Babcock & Wilcox Tube Co.	Alloy steel and tubes	$6,315,000
Nicholson Univ. Steamship	Transportation	$9,930,000
J. H. Holan Corp.	Truck bodies	$643,388
Detroit & Mackinac R.R.	Transportation	$600,000
Laclede Steel Co.	Steel ingots	$492,333
National Steel Corp.	Pig, iron, steel ingots	$3,319,000
Vanadium Corp. of America	Ferro chromium	$1,160,639
Vanadium Corp. of America	Silicon, ferro silicon	$6,910,000
Cleveland Graphite Bronze Co.	Aircraft parts	$561,699
Allis Chalmers Mfg. Co.	Cargo tractor	$2,576,000
A. P. Green Firebrick Co.	Refractories	$1,550,338
General Electric Co.	Electronic tubes	$336,306
Hot Point, Inc.	Aircraft parts	$1,913,000
Northrup Aviation, Inc.	Aircraft	$2,046,100
Cincinnati Milling Machine Co.	Machine tools	$4,156,958
Cincinnati Milling Machine Co.	Machine tools	$3,472,600
Cleveland-Cliffe Steamship Co.	Transportation	$6,000,000
Globe Brick Co.	Fire brick	$1,271,766
Consolidated-Vultee	Wind tunnel testing	$661,666
Consolidated-Vultee	Wind tunnel testing	$1,333,333
Consolidated-Vultee	Wind tunnel testing	$666,667
Consolidated-Vultee	Wind tunnel testing	$661,666
Consolidated-Vultee	Wind tunnel testing	$661,675
Jones & Laughlin Steel Corp.	Pig iron	$8,955,300
Jones & Laughlin Steel Corp.	Steel ingots	$9,259,000
Jones & Laughlin Steel Corp.	Rolled steel	$9,144,850
Jones & Laughlin Steel Corp.	Steel ingots, slabs	$1,485,000
Wright Aeronautical Corp.	Aircraft parts	$578,600
Wright Aeronautical Corp.	Aircraft parts	$5,334,440
Wright Aeronautical Corp.	Aircraft parts	$6,124,000
Republic Steel Corp.	Seamless tubing	$21,500,000
North American Refractories Co.	Refractory brick	$737,701
Jones & Laughlin Steel Corp.	Steel beams, angles, wire	$2,154,000
Jones & Laughlin Steel Corp.	Steel	$201,600
Jones & Laughlin Steel Corp.	Hot-rolled steel	$709,000
Intern'l Minerals & Chemicals Corp.	Chemicals	$6,600,000
Stowe-Fuller Refractories Co.	Silica refractory brick	$197,000
Robinson Clay Co.	Silica refractory brick	$185,400
Stowe-Fuller Refractories Co.	Silica refractory brick	$369,000
General Electric Co.	Electronic equipment	$15,693,000
Cleveland-Cliffe Steamship Co.	Cargo ships	$4,000,000
Hughes Aircraft Co.	Ordnance supplies	$7,289,000
Westinghouse Electric Corp.	Aircraft supplies	$24,500,000
General Electric Co.	Aircraft parts	$25,695,911
General Electric Co.	Aircraft parts	$4,037,624
General Electric Co.	Aircraft parts	$647,689
Clayton Mfg. Co.	Cleaning machines, dynometers	$38,106
Gem City Engineering Co.	Tools, dies, gauges	$69,466
Cincinnati Gear Co.	Gears	$97,791
Goodyear Tire & Rubber Co., Inc.	Tank tracks	$398,695
Goodyear Tire & Rubber Co., Inc.	Tank wheels & rollers	$322,855

Turn Page

Every Minute Meant a $1920 saving



Big return for a minute's time . . . but to a leading Philadelphia manufacturer* a 5 minute interview did result in a total saving of $9600.

This manufacturer faced a problem that's common to many plants today. His ten machines have 560 bearings—560 bearings that must be kept lubricated if production is to be kept uniform, rejects few. That lubrication job was taking four man hours every week and, because of human fallibility, there was always the potential danger that one of these many bearings had been overlooked or under lubricated.

An Alemite Lubrication Engineer was called in. He made his presentation in just 5 minutes—5 minutes that saved $9600. He told the manufacturer the facts of installing a modern Alemite Centralized Lubrication System. That system is in the plant today. The result: assurance of continuous, correct lubrication, few rejects and shut downs, and the addition of a whole hour's production time every working day.

Call Your Alemite Lubrication Engineer

No matter what size or type of plant you operate, Alemite can show you dozens of ways to save through the more efficient handling of petroleum products. Call your local Alemite Industrial Distributor now or send for the free booklet "11 Ways to Cut Production Costs." Simply attach the coupon below to your letterhead. Dept. **N-31**, 1850 Diversey Parkway, Chicago 14, Illinois.

**Name on request.*

ALEMITE

REG. U.S. PAT. OFF.

MEANS EVERYTHING FOR LUBRICATION

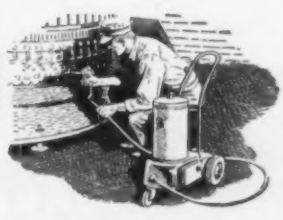
1. Methods 2. Lubricants 3. Equipment

Another Product of Stewart-Warner

Alemite Cuts Costs 3 Ways

1. In transferring lubricants... cuts man hours 63% for every 100 pounds transferred. No mess, no contamination.

2. In loading grease guns . . . saves 3¾ man hours for every 100 pounds of lubricant loaded into hand guns.



3. In applying lubricants . . . saves up to 23.9 man hours for every 100 pounds of lubricant applied to bearings.

FREE! Valuable booklet—
"11 Ways to Cut Production Cost"
(Simply attach to your letterhead)
ALEMITE, Dept. N-31
1850 Diversey Parkway, Chicago 14, Ill.

We'll include facts on the new Alemite Oil-Mist System, too—(OIL-MIST atomizes oil into mist, circulates it to bearings under pressure. Increases life of bearings as much as 17½ times).

Name_____

Company_____

City_____ State_____

"It's my job to bridge the gap"

They say I'm an all-department guy. Sometimes I'm the boss and other times I'm just a flunky. My main job, though, is to help you get the metals you need in these tough shortage days.

I may be scouting for a bar of 2" cold finish for a breakdown job, or trying to figure out how a 6" channel can do where an 8" channel was called for; or perhaps studying your design to see if your requirements can be met with less metals.

Sometimes I feel like beefing about limited inventories and increased demands . . . but it takes all of my ingenuity, imagination and time, and plenty of old fashioned plugging to bridge the gap between our supply and your needs.

"Shorty"

P.S. Remember, I always charge fair prices, no matter what the market or the supply. That's company policy.

Levinson

STEEL SALES CO.

Warehouse Aluminum & Steel Products

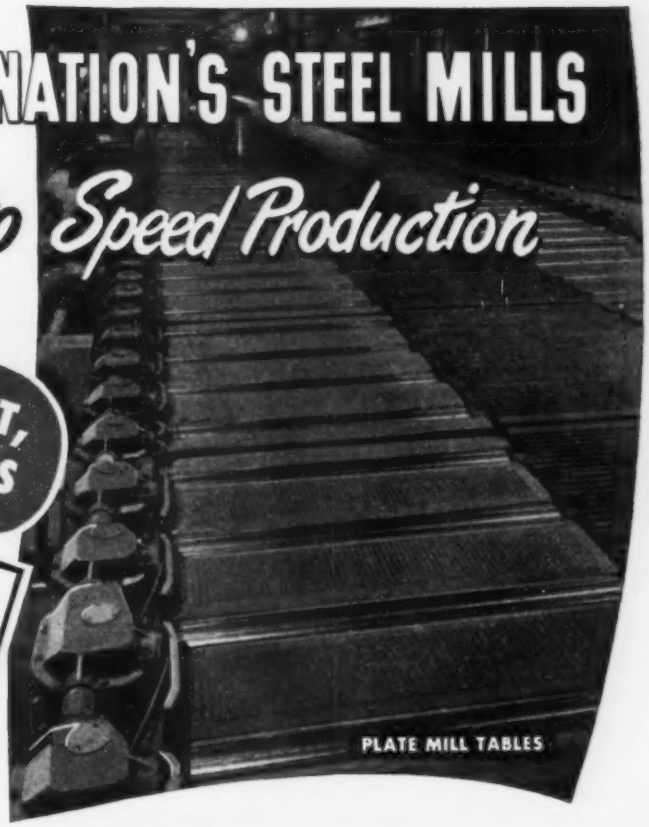
LSS-11

20TH AND WHARTON STS. S. S., PITTSBURGH, PA.

Name of Company	Product or Use	Amount Certified
Southern Pacific Co.	Transportation	$4,591,500
Greenback Industries, Inc.	Copper, tin, brass powder	$370,922
Ferrocute Machine Co.	Power presses	$186,275
Patterson Foundry & Machine Co.	Rolling mill equipment	$73,767
Nelson Stud Welding	Welding equipment	$184,660
Wendt-Sonis Co.	Tools, machinery	$14,436
Accurate Products Co.	Experimental tools	$102,715
Standard Steel Spring Co.	Springs for vehicles	$101,800
Kingston Products Co.	Tank truck pins	$49,146
Crobalt, Inc.	Cutting tools	$41,200
Rheem Mfg. Co.	Metal shipping containers	$534,783
Skarda, Inc.	Ordnance supplies	$172,411
Continental Foundry & Machine Co.	Tank turrets	$192,711
Continental Foundry & Machine Co.	Coat armor	$60,776
Therm Electric Meters Co., Inc.	Forge dies, trim dies	$196,314
Avalon Mfg. Co.	Sockets, terminals, rivets	$20,826
Westberg Tool & Mfg. Co.	Tools and dies	$6,426
Union Pacific R.R. Co.	Transportation	$5,807,500
General Motors Co.	Diesel engines	$1,317,893
Master Tool & Die Co., Inc.	Tank parts	$10,202
Bryant Checking & Grinding Co.	Rifles, grinding machines	$37,876
Cincinnati Milling Machine Co.	Abrasive, grinding wheels	$374,040
Stewart-Warner Corp.	Ordnance supplies	$503,461
Pittsburgh Coke & Chemical Co.	Pig iron	$9,150,000
Timken Roller Bearing Co.	Steel bars, seamless tubing	$3,462,000
H. P. Deuscher Co.	Gray iron castings	$33,791
Firth Sterling Steel & Carbide Co.	Metal cutting tools	$219,956
Hartford Electrical Steel Corp.	Steel sheet	$3,243,000
New Britain Machine Co.	Bolts and nuts	$737,159
American Brake Shoe Co.	Brake lining	$13,593
Cincinnati Gear Co.	Gears	$236,643
Timken-Detroit Axle Co.	Axle transfer cases, parts	$15,650,000
Screw Products of America	Self-locking nuts	$1,575,709
International Business Machines Corp.	Ordnance supplies	$17,910,000
Burgess-Norton Mfg. Co.	Tank truck bodies	$157,600
Cupples Products Corp.	Alloy aluminum extrusions	$881,798
Rockford Aeromatic Products Co.	Universal joint bearings	$33,000
Eaton Mfg. Co.	Compressor blades for aircraft	$850,000
National Steel Corp. (Wierton Div.)	Pig iron	$15,450,000
Fairchild Camera & Instrument Co.	Aerial photo equipment	$4,395,292
Lodish Corp.	Steel forgings	$3,757,452
Shenango Furnace Co.	Transportation	$1,158,000
Shenango Furnace Co.	Transportation	$798,671
Shenango Furnace Co.	Transportation	$1,050,500
Chisholm Boyd & White Co.	Mechanical press	$28,040
Aircraft Tapered Sheets, Inc.	Wings, fuselage fittings	$499,204
Pratt & Letchworth Co., Inc.	Core assemblies	$210,908

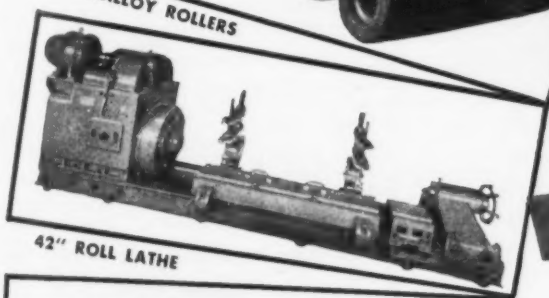
In addition to the above listing, three applications from the Kaiser Aluminum and Chemical Corporation have been certified for indefinite amounts pending the submission of supplemental information by Kaiser. Total amount of the three original applications was $80,500,000.

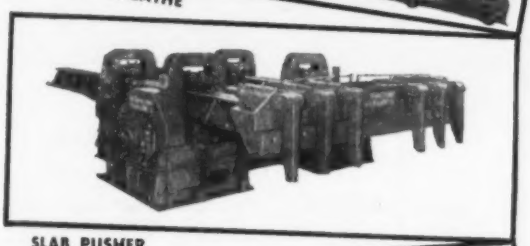
F&Ym EQUIPS THE NATION'S STEEL MILLS to Speed Production

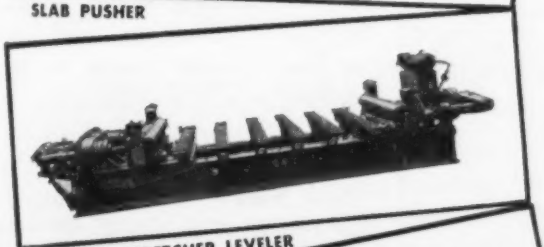


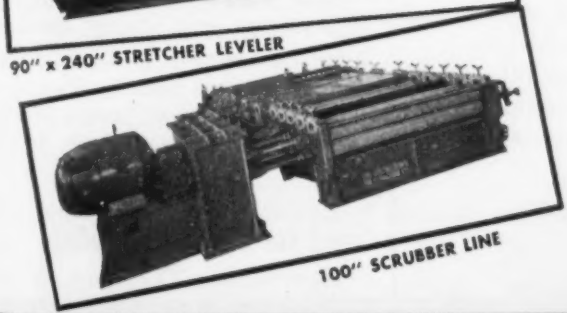
MACHINES, EQUIPMENT, ROLLS AND CASTINGS

PARALLOY ROLLERS


42" ROLL LATHE


SLAB PUSHER


90" x 240" STRETCHER LEVELER


100" SCRUBBER LINE

Check this List for the Products You Need

- PARALLOY ROLLS (Pinch, Coiler, Tension, Steel Mill)
- HYDRAULIC SLAB AND BILLET PILERS
- STRIP AND SHEET OILING EQUIPMENT
- SHEET SCRUBBER AND CLEANING LINES
- HOT SAWS—ROCKING AND SLIDE TYPES
- HOT BEDS—COOLING BEDS—TRANSFERS
- BILLET EJECTORS—PINCH ROLL STANDS
- SLITTERS—SPECIAL SHEARS AND GAUGES
- TILTING TABLES—Traveling and Lifting Tables
- Continuous PICKLING Lines—ROLLER LEVELERS
- FURNACE Charging Equipment—Furnace Pushers
- Strip Steel COILERS and REELS—SCRAP BALLERS
- RAILROAD Spike Forming Machines—ROLL LATHES
- Sheet GALVANIZING Lines—Wire Patenting Frames
- Stretcher Levelers—Angle and Shape Straighteners
- Rolling Mill Tables—Gear and Individual Motor Types
- DUCTILE CASTINGS (80,000 PSI.)

Machinery Built to Customer's Design and Detail Drawings

The Youngstown Foundry & Machine Co.

OVER SIXTY YEARS OF SERVICE TO THE STEEL INDUSTRY

Youngstown, Ohio

Torrington 12-Roll Tube Straighteners on the job for American Brass at Kenosha, Wis.

American Brass installs 4 Torrington Straighteners in new Kenosha Tube Mill

As part of a "continuing program of improving plant facilities and equipment", the American Brass Company has installed 4 Torrington 12-Roll Tube Straighteners and other Torrington machinery in the recently completed tube mill at Kenosha, Wisconsin.

FEATURES OF TORRINGTON 12-ROLL HIGH-SPEED STRAIGHTENERS

1. Versatile: handles round, hexagon, square or rectangular rods and tubes.
2. High-speed: processes up to 700 feet per minute.
3. Fast set-up and adjustment: rolls are overhung, without outboard bearings.
4. Long-life, trouble-free construction: all gears run in oil and are totally enclosed.
5. Anti-friction bearings throughout.
6. Flexible: has easily-adjustable power drive.
7. Positive action: all rolls are power-driven.

The Torrington line also includes both 12-Roll and 24-Roll Straighteners in a variety of models which can be adapted to your particular needs. Torrington skill, knowledge and experience, gained from more than 60 years of close collaboration and cooperation with metal mills, is at your service to help you with your problems.

Call or write Torrington for information and nearest Torrington representative

The TORRINGTON

MANUFACTURING COMPANY • TORRINGTON, CONNECTICUT

DESIGNERS AND BUILDERS OF MILL MACHINERY FOR OVER 60 YEARS

STEEL CONSTRUCTION NEWS

Fabricated steel awards this week included the following:

1500 **Tons,** Philadelphia, Philco Corp. Bldg. No. 10, to Bethlehem Steel Co., Bethlehem.

1300 **Tons,** Philadelphia, Jefferson Hospital, to Bethlehem Steel Co., Bethlehem.

400 **Tons,** Ocean County, N. J., highway bridges for New Jersey State Highway Dept., Ole Hansen, general contractor, to Bethlehem Steel Co., Bethlehem.

325 **Tons,** Newton, Iowa, Maytage plant to St. Paul Foundry, St. Paul.

250 **Tons,** Philadelphia, alterations to Penn A. C. Building for the Dept. of the Army, to Bethlehem Fabricators, Inc., Bethlehem.

Fabricated steel inquiries this week included the following:

1020 **Tons,** Bradley, Ill., Armour & Co. pharmaceutical plant.

600 **Tons,** Warren, Ohio, three warehouses for GSA.

600 **Tons,** Hammond, Ind., three warehouses for GSA.

400 **Tons,** Dayton, Ohio, two warehouses for GSA.

300 **Tons,** Jasper County, Iowa, bridge project FN-64.

235 **Tons,** Waukesha County, Wis., bridge project F-05-1/26/.

144 **Tons,** Mitchell County, Iowa, bridge project S-995-1.

Reinforcing bar awards this week included the following:

1500 **Tons,** Milwaukee, grain elevator Schlitz Brewing Co. to Joseph T. Ryerson & Son.

600 **Tons,** Chicago, Twin Towers Apts. to Joseph T. Ryerson & Son.

460 **Tons,** Maywood, Ill., Congress St. Expressway to Ceco Steel Products Co.

355 **Tons,** Chicago, Congress St. highway to U. S. Steel Supply Co.

350 **Tons,** Chicago, Zenith Radio Corp. to Ceco Steel Products Co.

175 **Tons,** Athens, Ohio, bridge to Ben Tom Steel Co.

125 **Tons,** Akron, Goodyear Tire and Rubber Co. to U. S. Steel Supply Co.

Reinforcing bar inquiries this week included the following:

550 **Tons,** Lexington, Ky., Lyrone power station.

270 **Tons,** Chicago, staff apt. bldg., Medical Center Comm.

200 **Tons,** Louisville, National Distillers Products Corp.

200 **Tons,** Broadview, Ill., Ford Motor Co.

185 **Tons,** Kanawha County, W. Va., South Charleston bridge.

150 **Tons,** Milwaukee, Nordberg Co.

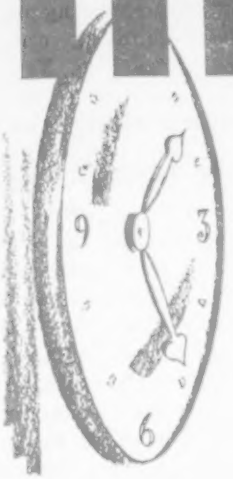
Construction Awards Higher

New York—February construction awards of $1,140,527,000 were 9 pct higher than in January and 46 pct higher than in February last year in the 37 states east of the Rockies, reports F. W. Dodge Corp.

Steel for Shells and Bullets

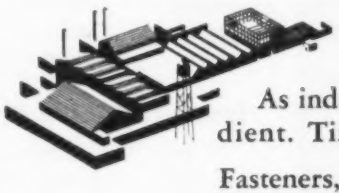
Washington—The Army will begin manufacture of steel cartridge cases for small arms and artillery ammunition, replacing brass, to conserve copper and zinc. Despite more complicated production the steel cases may cost less than the brass because of the lower cost of steel.

time is our greatest ally!



Let's save it on the assembly line

—beginning now!



As industry gears for defense, *time* is a most precious ingredient. Time to redesign, to retool and, finally, to produce.

Fasteners, as always, will play an important part in forging America's mailed fist. And the fasteners specified on blueprints today will determine whether production hours are saved, or wasted, in the future.

Careful selection of the most efficient fastener for each holding job can save these hours . . . can speed assembly and eliminate time-wasting fumbling. It is important, also, to consider design, tolerances as well as raw material, heat-treatment and finishes when making a fastener selection.

We at Lamson & Sessions will be happy to consult with you on any fastener problem—and recommend the most efficient one for the particular job at hand.

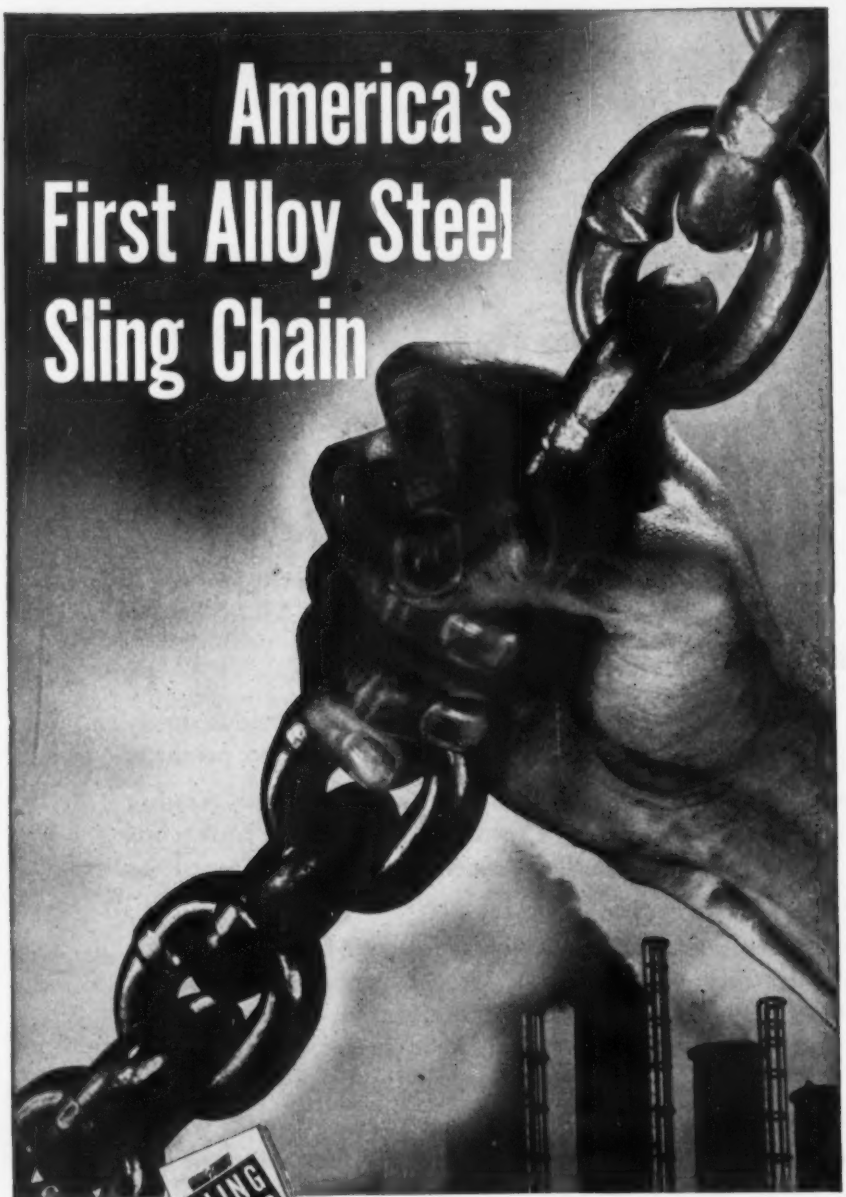
The home of "quality controlled" fasteners

Lamson & Sessions

The LAMSON & SESSIONS Co. • General Offices: 1979 West 85th Street • Cleveland 2, Ohio

Plants at Cleveland and Kent, Ohio • Birmingham • Chicago

CM HERC-ALLOY



Write for your copy of this new, informative booklet. No charge.

COLUMBUS-McKINNON
CHAIN CORPORATION
(Affiliated with Chisholm-Moore Hoist Corporation)
GENERAL OFFICES AND FACTORIES: TONAWANDA, N. Y.
SALES OFFICES: NEW YORK, CHICAGO, CLEVELAND AND SAN FRANCISCO

publications

Continued from Page 34

speccifications. The booklet presents a fascinating picture story of the steps of manufacture from skelp through the heating furnace, the continuous welding process, and numerous finishing operations. *Spang-Chalfant Div., National Supply Co.*

For free copy insert No. 9 on postcard, p. 35.

Reduce Handling Costs

How to build profits by cutting handling costs is the subject of a new 12-p. chain conveyer bulletin stressing the importance of careful selection of chain conveyers in the instances where they apply. While the booklet shows numerous examples of chain conveyer application, it is intended to be more of a thought-provoker than a detailed catalog and to suggest the correct method for conveying or handling a product. *Chain Belt Co.*

For free copy insert No. 10 on postcard, p. 35.

Insulating Fire Brick

A new 4-p. illustrated folder on JM-3000 insulating fire brick presents the economic advantages, industrial applications and refractory properties of this product for sustained use at 3000°F. Physical and thermal characteristics are tabulated, and one section highlights the use of these brick in the construction of a slot-type forging furnace. The folder also summarizes information on accessory materials and other insulating brick. *Johns-Manville.*

For free copy insert No. 11 on postcard, p. 35.

Air Motors

The story of the Bellows air motor is told in a new 24-p. booklet giving a new conception of the production possibilities of air power. Means by which these controlled air-power devices provide more profitable operations are explained, and numerous installations are illustrated. Specifications, design and construction features are dealt with, and several models of impact and arbor presses and time-control units are shown. *Bellows Co.*

For free copy insert No. 12 on postcard, p. 35.

Turn to Page 106

FIGHT WASTE

IN PEACE WASTE IS A SIN...
NOW...WASTE IS A CRIME!

DISSTON
Announces a New
WASTE PREVENTION PLAN
for tool steel users

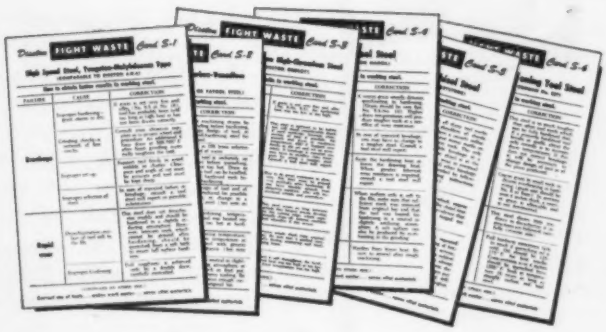
Tool steels rank high on the list of critical materials for industrial expansion. Growing shortages are forcing many users to turn to unfamiliar types of steels for tool production.

NOW DISSTON PRESENTS A PLAN TO STRETCH THE SUPPLY OF AVAILABLE TOOL STEELS—TO HELP YOU GET MORE OUT OF THE STEEL YOU ARE USING —THE DISSTON "FIGHT WASTE" PROGRAM!

DISSTON GIVES YOU "FIGHT WASTE" MATERIAL FREE!

The basis for the program is the use of educational FIGHT WASTE Cards on six basic types of tool steels. These individual cards contain information on the selection, working, and application of tool steels to help you get better tool performance and longer tool life—to help cut waste of vital steels.

These cards are supplied free—without cost or obligation—in quantities desired. Order by number:



No. S-1 HIGH SPEED STEEL, TUNGSTEN-MOLYBDENUM TYPE
(Comparable to DISSTON 6-N-6)

No. S-2 WATER-HARDENING CARBON OR CARBON-VANADIUM TOOL STEEL
(Comparable to DISSTON Best Tool or Vatool Steel)

No. S-3 AIR HARDENING, HIGH-CARBON HIGH-CHROMIUM STEEL
(Comparable to DISSTON Croloy)

No. S-4 OIL-HARDENING TOOL STEEL
(Comparable to DISSTON Mansil)

No. S-5 CHROME-TUNGSTEN CHISEL STEEL
(Comparable to DISSTON Keystone)

No. S-6 NICKEL-CHROME, OIL-HARDENING TOOL STEEL
(Comparable to DISSTON Nicroman No. 827)

Disston also has FIGHT WASTE instruction cards covering a variety of wood and metal cutting *tools*. These cards provide specific information on the most efficient use and care of tools to reduce breakage, stop waste of material, and increase production. We will send you information on these cards.

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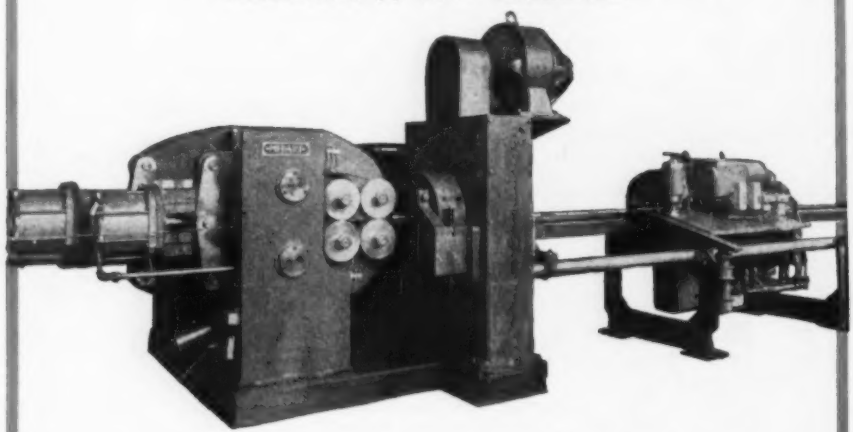
TOOL STEELS • BAND SAWS FOR WOOD & METAL • SOLID & INSERTED TOOTH CIRCULAR SAWS • MACHINE KNIVES • FILES & RASPS • HACK SAWS • CARBOLOY-FITTED SAWS & KNIVES • CUTTER HEADS • CHAIN SAWS

Triple Production or Better on Bar & Tube Turning!

MEDART

RFPD AUTOMATIC CENTERLESS BAR TURNERS

FOR BARS ¼" to 6" DIAMETER



▶ The unsurpassed production speeds of the RFPD Turner using carbide cutting tools—up to 12 ft. per minute—average from 3 to 4 times that of conventional turners by actual comparison.

▶ Material turned on this machine can be sold directly from the machine for "as turned" stock, put through the Medart two-roll rotary straightening, sizing and polishing machines for "turned and polished" stock, or given one pass through a centerless grinder for "ground" stock.

▶ The RFPD turning gives 100% material recovery with short, easy-to-handle chips.

▶ Direct-drive cutterhead, through single V-belt drive, is a single compact unit designed for either brazed tip or mechanically held carbide tools.

▶ Controls provide fully automatic push-button operation through entire cycle, and supplementary manual operation for setup. Both speeds and feeds are infinitely variable.

Many other cost-reducing, time-saving exclusives are offered in the RFPD Centerless Bar Turner.

Write For Illustrated Brochure

THE MEDART COMPANY 3535 De Kalb Street St. Louis 18, Mo.

publications

Continued

Hollow Staybolts

Staybolt facts based on more than 50 years' experience are presented in a new 6-p. folder describing the material and manufacture of Falls hollow staybolts. The bulletin tells how this product offers greater safety on modern high-pressure locomotives since it is hollow and will disclose absolutely when fracture occurs. Results of ten tests made by a leading railroad are tabulated. *Falls Hollow Staybolt Co.*

For free copy insert No. 13 on postcard, p. 35.

Tungsten Carbide

Timely information and engineering data on Sinterforge hot-pressed tungsten carbides are featured in a 6-p. bulletin answering the most commonly asked questions about these sintered products. The various grades available are described in detail, along with information on typical applications and properties. Examples of shapes and types available are illustrated. *Sintercast Corp. of America.*

For free copy insert No. 14 on postcard, p. 35.

Alloy Steel Use

Entitled "Republic Alloy Steels and How to Get the Most Out of Them," a new 16-p. booklet contains seven case histories which show how Republic alloy metallurgists have helped customers increase production and cut costs through the intelligent specification of alloy steels. Case histories were selected from widely varied fields in order to demonstrate the versatility of alloy steels. *Republic Steel Corp.*

For free copy insert No. 15 on postcard, p. 35.

Flexible Couplings

Engineering information for proper application of Link-Belt "RC" roller chain flexible shaft couplings is presented in a new 4-p. folder giving data on dimensions, weights, service factors and horsepower ratings. Two types of protective grease-retaining casings, style R (spun metal revolving type) and style P (plastic, revolving type), are also covered in detail. *Link-Belt Co.*

For free copy insert No. 16 on postcard, p. 35.

Resume Your Reading on Page 35

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and the

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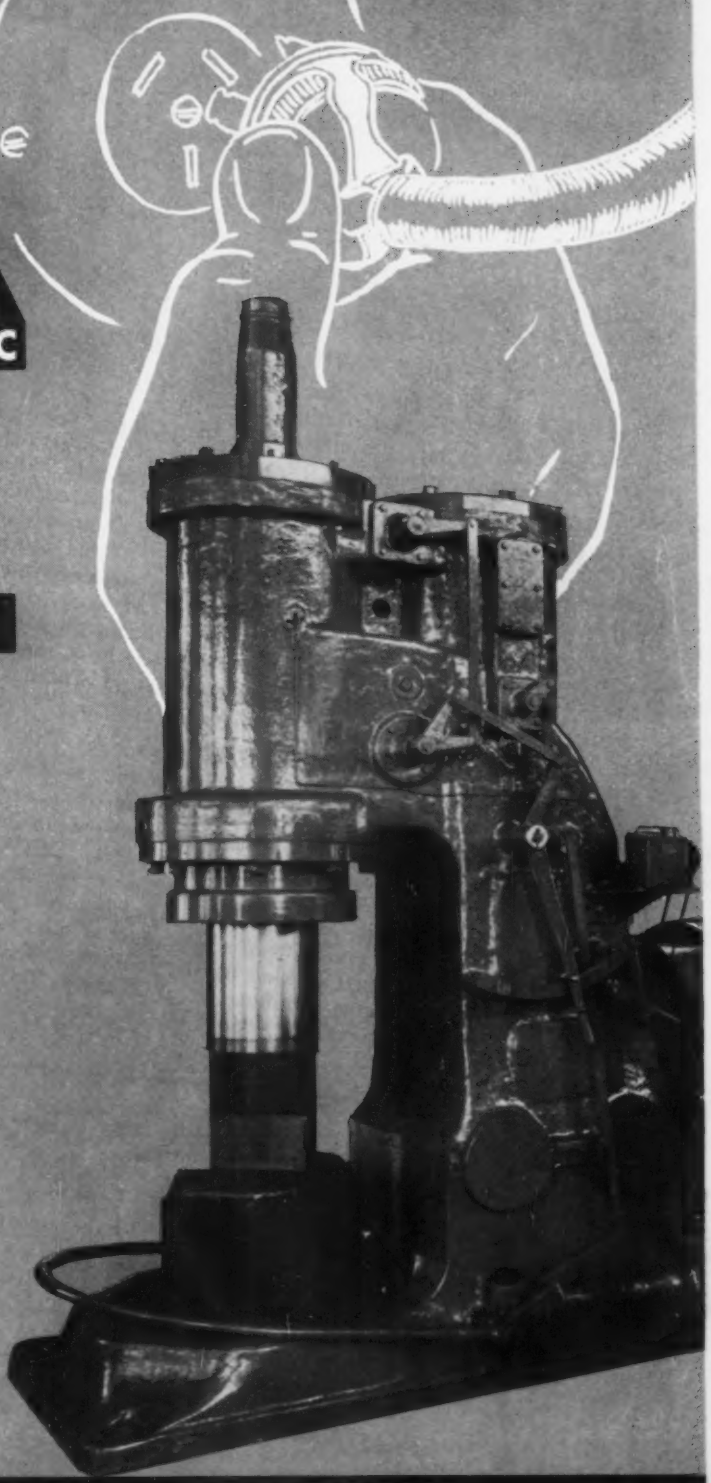
is ready to GO



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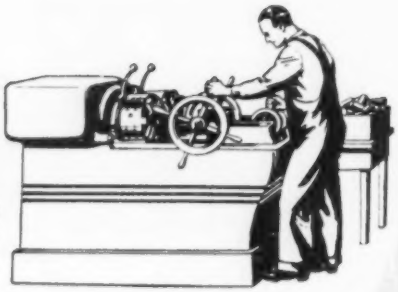
TIPS ON TAPPING AND THREADING TROUBLES



Page A-6

DATA

OILS FOR TAPPING AND THREADING

OILS WITH ACTIVE SULPHUR REQUIRED

Tapping and threading are difficult machining operations due primarily to limited chip room and the difficulty of maintaining sufficient lubrication at points of contact between threading tool and workpiece. Cutting oils having high sulphur activity are usually required and recommended for difficult threading and tapping work. Stuart's THREDKUT and related products, due to their high effective sulphur content, have been outstanding for this class of work. Active or effective sulphur in an oil functions as an anti-weld agent preventing pick-up of metal particles on the tool which results in scuffing and poor finishes.

RULE OF THUMB

Here is a good rule of thumb to remember when sulphurized cutting oils are being used:

When you observe excessive wear on the front clearance of cutting tools, DECREASE the amount of active sulphur in the oil by diluting with paraffin oil or other low cost blending oil. If poor finish is encountered due to welding or metal pick-up on the tool edge, INCREASE the active sulphur, or if Stuart's THREDKUT is being used, apply it straight.

RESULTS

Operation: Threading male pipe union sections on large automatics using single point tools.
Material: Type 310 stainless steel.

Oil:	Previous Oil	Stuart's THREDKUT 9961
Tool Life:	136 pcs. per tool grind	310 pcs. per tool grind
Part Finish:	Fair	Excellent
Cutting Fluid Costs on Machine:	$0.47 per gallon	$0.44 per gallon

Write for Literature and ask to have a Stuart Representative call

D.A. Stuart Oil Co.

2737 S. Troy Street, Chicago 23, Ill.

production ideas

Continued from Page 38

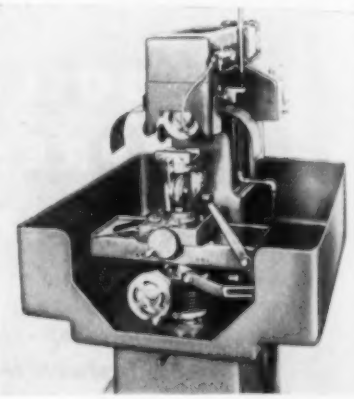
or gap and a 48-in. back gage range. Standard equipment includes four edge high carbon tool steel knives with straight sides and a section measuring 1¾ x 6½ in., ball bearing back gage with graduated dials, automatic lubrication, hinged angle and complete guarding. *Cincinnati Shaper Co.*

For more data insert No. 33 on postcard, p. 31.

Carbide Tool Grinder

For diamond finishing and for grinding chip-breakers.

A new addition to the Hammond line of carbide tool grinders is Model CB-77-W, wet combination chip breaker and diamond finishing grinder. The cup wheel side is for



diamond finishing. The chip breaker side is not only for grinding chip-breakers but is also designed for use with the Hammond VC solid carbide insert grinding fixture. Coolant is provided by self-contained pump and tank unit, and coolant spouts can be swiveled to direct coolant to desired point. *Hammond Machinery Builders, Inc.*

For more data insert No. 34 on postcard, p. 31.

Rotary Milling Attachment

12-in. diam table, for use with smaller knee-type milling machine.

Both manual and power feed styles of a new circular or rotary milling attachment have a 12 in. diam table, machined with four standard 9/16 in. T slots; rotated through a worm and wheel having 80:1 ratio; and graduated in degrees on its circumference. The handwheel dial is graduated in min

NO WORRY Over Alloy Shortages Here!

Courtesy—Errington Mechanical Laboratory, Inc.

Restrictions in the use of nickel alloys almost brought production of these gears to a halt. Instead, an increasing number of gears are being produced to meet defense requirements—and vital nickel is being conserved. The story contains an idea you, too, may find useful.

The gears, machined from alloy bar stock, form the gear train in a multiple drill head—a versatile, high speed production tool. Precision made to individual specifications, this drill head can drive a number of drills or taps simultaneously, each at its own spindle speed, with only a single work set-up.

The builder—unable to obtain enough nickel moly steel to meet production goals—posed his problem to Frasse Technical Service. Frasse engineers, through wide experience in solving similar problems during World War II, recommended the use of a lean nickel-chrome-moly type, and a heat treatment to suit. The substitute not only met requirements, but was available from Frasse warehouse stock.

Substituting is not a new idea—but are you using it to full advantage? If steel supply is causing you anxiety, why not let a Frasse engineer check "specs" with you? Perhaps he can find you a suitable substitute that's a bit easier to get. There's no obligation. Just write or call your nearest Frasse office today. *Peter A. FRASSE and Co., Inc., 17 Grand St., New York 13, N. Y. (Walker 5-2200) • 3911 Wissahickon Ave., Philadelphia 29, Pa. (Baldwin 9-9900) • 50 Exchange St., Buffalo 3, N. Y. (Washington 2000) • 157 Richmond Ave., Syracuse 4, N. Y. (Syracuse 3-4123) • Jersey City • Hartford • Rochester • Baltimore.*

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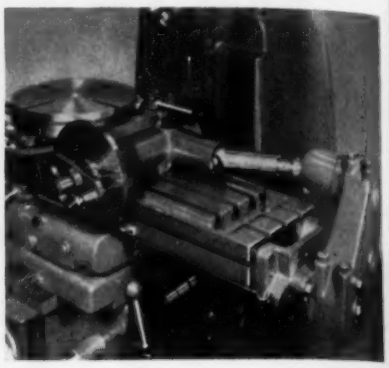
production ideas

Continued

utes. The power feed attachment is driven by the machine on which it is mounted. A shaft beneath the table and parallel to the feed screw drives a gear train within the bracket attached to the right-hand end of the table. Power is transmitted from the gear train to the



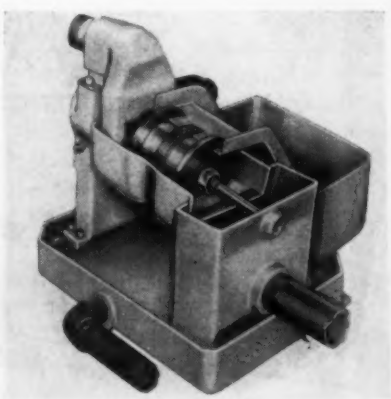
attachment by a universal joint, telescoping shaft. A reverse clutch arrangement permits the table to be driven clockwise or counter-clockwise, or disengaged for manual rotary adjustment. An auxiliary indexing attachment is available. *Cincinnati Milling Machine Co.*

For more data insert No. 35 on postcard, p. 35.

Coolant Clarifier

Removes 98 pct of contaminants by use of permanent ring magnets.

Removal of metallic and abrasive particles from mineral oils and soluble oil solutions used for grind-



ing and cutting operations is accomplished by use of permanent ring magnets completely enclosed in revolving nonmagnetic cylinder. Circular steel disks, end pieces of the cylinder acting as magnetic

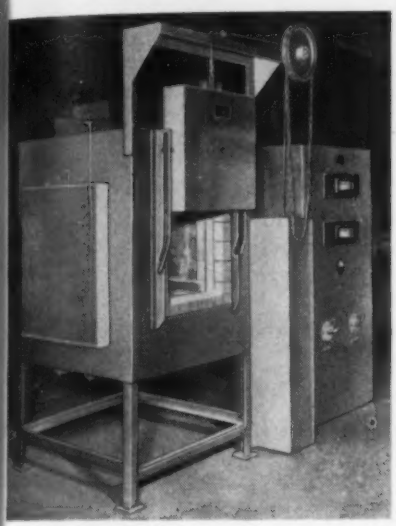
poles, seal off the magnet cores to prevent fluid from coming in contact with magnets. The design provides 360° of constant magnetic attraction and a continuous delivery of clean coolant to machine sump for reuse. The unit is rated at 20 gpm. *Honan-Crane Corp.*

For more data insert No. 36 on postcard, p. 35.

Heat Treating Furnace

For heavy duty work; temperatures to 2500°F. absolute max 2700°F.

Spacious work chamber, accurate temperature controls, and versatile operating features make the Model FG-7800 electric furnace suitable for heavy-duty heat treating work. A separate control panel is equipped



with voltage-regulating, multi-tap transformer; temperature indicator and controller; magnetic contactor; and a high limit cutoff that acts to safeguard the furnace from accidental overheating. Overall size is 33¼ in. wide x 39¼ in. long x 64 in. high, with loading area 18x24x18 in. Heating elements are the Globar silicon carbide type to reach and maintain temperatures uniformly at all levels within its range. Maximum connected load is 34.5 kw. Operating current is 220 v, 3-phase. *Pereny Equipment Co.*

For more data insert No. 37 on postcard, p. 35.

Dry Conditioner

Gives precise humidity control in temperatures –40° to + 100°F.

Manufacture of a new absorption-type package unit for year-round humidity control and protection against rust, mold, mildew and corrosion in industrial applications has

A Quality Product

Michigan Electric Resistance WELDED STEEL TUBING

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⅜" to 4" O. D. 9 to 22 gauge

SQUARE-RECTANGULAR

½" to 2" 20 gauge, 1" to 2¾", 14, 16, 18 gauge

Carbon 1010 to 1025

Michigan Tubing has uniform strength, weight, ductility, I. D. and O. D., wall thickness, machinability, and weldability. It can be flanged, expanded, tapered, swaged, beaded, upset, flattened, forged, spun closed, fluted, and rolled. Available in a wide range of sizes, shapes and wall thicknesses, prefabricated by Michigan or formed and machined in your own plant.

Consult us for engineering and technical help in the selection of tubing best suited to your needs.

No Job too Tough

No job is too tough for American workmanship. But the demands of the defense emergency have presented many problems in design simplification to reduce costly production delays. Electric resistance welded steel tubing, as manufactured by Michigan, is a simple and economical answer to many such problems.

During World War II we were among the foremost suppliers of tubing for widely different defense uses, such as incendiary bomb casings, jeeps, trucks, and guns. Our manufacturing skill in the production of tubing for these and hundreds of other applications is at your disposal.

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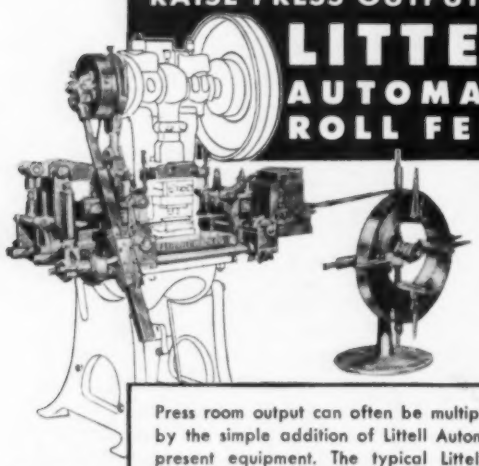
RAISE PRESS OUTPUT WITH
LITTELL
AUTOMATIC
ROLL FEEDS



Press room output can often be multiplied five times by the simple addition of Littell Automatic Feeds to present equipment. The typical Littell Double Roll Feed shown here grips the stock on both sides of the die to assure maximum traction and feeding power. Stock is easier to start and finish in progressive die work. No hand feeding at either end of the stock. Rack and pinion drive provides the smoothness and the gradual acceleration and deceleration of feed rolls for a truly accurate feed. Standard Littell Automatic Feeds serve all types and sizes of presses, handle all standard widths and thicknesses of stock.

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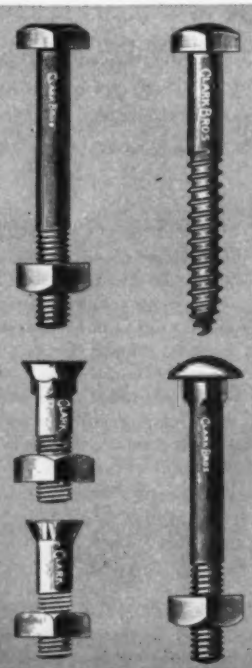

"...Built right...to hold tight —their dependability has been a recognized characteristic of CLARK FASTENERS for close to a Century. 6-L-1c

CLARK BROS BOLT CO.
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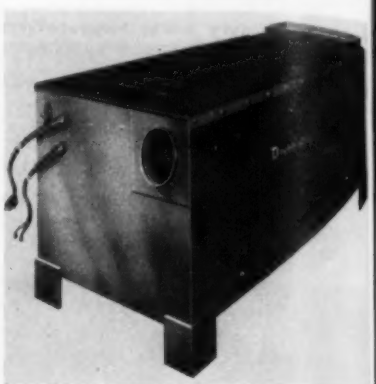
production ideas

Continued

been announced. The Model 100 unit is a three-channel continuous absorption dehumidifier with plug-in automatic operation. It is effective singly in enclosed areas up to 25,000 cu ft; in larger areas, a number can be installed. Measuring 45x19x16 in., the Dryomatic can be used inside or outside the area to be protected. It is a 110 v, 60-cycle, single-phase unit. *Dryomatic Corp.*

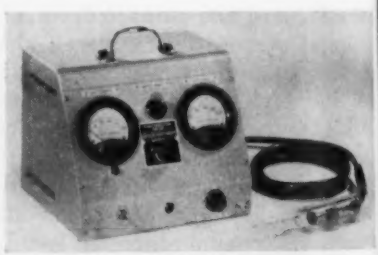


For more data insert No. 38 on postcard, p. 31.

Leak Detector

Detects minute leaks in high vacuum systems down to one micron Hg.

A new inexpensive sensitive detector serves those who have only occasional need for a leak detector, to establish the presence of a leak too small to be detected by more obvious signs. The instrument operates on the principle that the tendency of hot platinum to emit positive ions is enormously stimulated by infinitesimal traces of halogens or their compounds. In operation the glass sensitive tube is sealed into the system under test and the system is pumped down to a moderate vacuum. A jet of harmless Freon gas is then directed against portions of the system suspected of



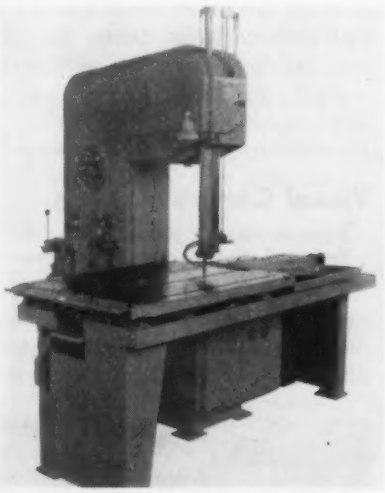
leaking. When the jet strikes a leak there is a sudden deflection of the meter needle on the instrument face. *Distillation Products Industries, Div. Eastman Kodak Co.*

For more data insert No. 39 on postcard, p. 35.

Special Band Saw

Has 36-in. stroke work table for machining jet engine components.

For this application the Contourmatic's work height was increased as required and the standard 16-in. stroke table was replaced by the larger capacity table that is used for fast, straight, accurate perpendicular power fed band sawing, slotting and grinding to close tolerance. Operation of this unit is accomplished hydraulically by control knobs in a central panel on the



column of the machine. The table handles work weighing up to 1 ton. Its feed rate is variable to 18 fpm with rapid return. The Contourmatic utilizes diamond and line grinding bands in addition to standard precision and buttress saw bands and abrasive polishing bands to 1 in. wide. Cutting speeds are infinitely variable from 40 to 10,000 fpm. *DoAll Co.*

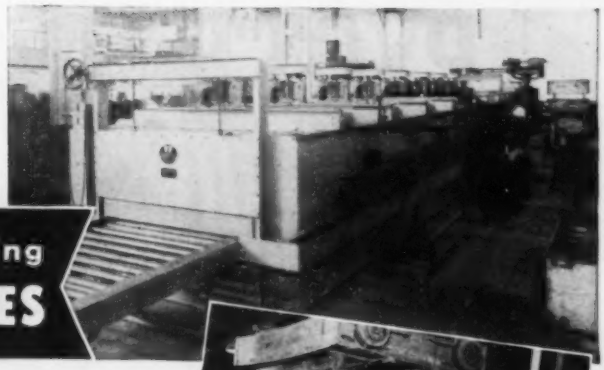
For more data insert No. 40 on postcard, p. 35.

Scrap Handling Hopper

Automatic self-dumping feature; capacity ranges from ½ to 2 cu yd.

Made of 3/16-in. reinforced steel plate, the new Brusco hopper speeds scrap handling and disposal in foundries, machine shops and metalworking plants. It is placed adjacent to the work area and when filled, the entire unit (hopper and skid) is moved by fork or pallet lift truck

EF



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for any Process, Product or Production
THE ELECTRIC FURNACE CO.
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Even pipe rides safely when tied with
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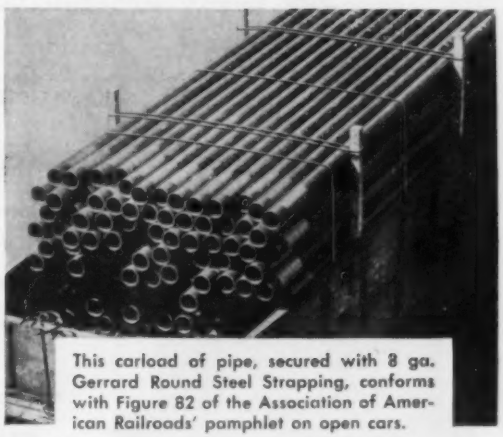

This carload of pipe, secured with 8 ga. Gerrard Round Steel Strapping, conforms with Figure 82 of the Association of American Railroads' pamphlet on open cars.

• Gerrard Round Steel Strapping makes a safe, tight reinforcement for railroad and truck shipments of oil well tubing (photo above), pipe, plate, drums and machinery. The firm, strong grip of Gerrard Steel Strapping keeps torsional sway at a minimum, and will hold your shipments securely until they reach their destination.

Gerrard Strapping itself costs about 40% less than any other metal reinforcement. And cost studies show that pipe can be secured on open cars at a saving of 36% to 47% when Gerrard Round Steel Strapping is used.

A Gerrard engineer will gladly give you the full story about the Gerrard Method of Strapping. His advice is yours without obligation. Write for a free copy of *Blue Book of Packaging.*

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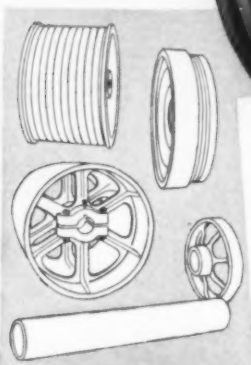

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- The effect of heat treatment to establish a scientifically correct annealing technique.

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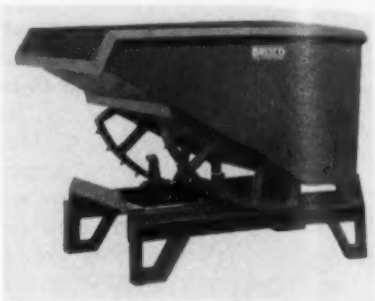
production ideas

Continued

to the dumping area. An easy to operate release can be tripped from the lift truck to facilitate handling. The hopper is constructed so the center of the load is located over



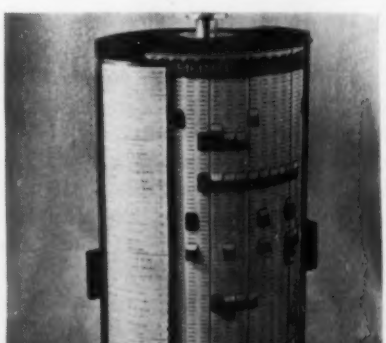
the rocker. When the release is tripped the forward weight of the load automatically dumps the load and the empty hopper returns to normal position automatically. *Brummeler Steel Products Co.*

For more data insert No. 41 on postcard, p. 35.

Visual Control System

Permits efficient planning to forestall bottlenecks, shortages.

Visi-Control, as this planning device is called, gives at all times a picture of such operations as production, traffic, sales, inventory and



scheduling. Data recorded on the cylinder progress simultaneously at predetermined intervals toward a chosen date-line. The perforated cylinder has a capacity of 5000 data holders. *Lyons - Thompson Systems, Ltd.*

For more data insert No. 42 on postcard, p. 35.

Resume Your Reading on Page 39

IRON AGE *markets and prices*

market briefs and bulletins

rail rates increase—Freight rates on iron, steel and a large variety of products will be increased by an average of 2.4 pct by the Interstate Commerce Commission—probably effective Apr. 3. The hikes will be 4 pct within the eastern territory, 2 pct for southern and western territories, and 2 pct interterritorially. Iron ore will take the general percentage increase—but no increase will be authorized in line-haul rates on ore to upper Lake ports for transshipment by water, or from Minnesota ranges to Duluth. Rail proposals to boost port handling charges were rejected.

ore for America—In 4 years Venezuelan mines operated by United States money should be producing iron ore at the rate of 11 million tons annually, report Venezuelan officials. They say American steel firms have already put over $42 million in the mines and surveys indicate existence of more than a billion tons of iron ore. Proven high content reserves amount to more than 525 million tons.

ore rates frozen—Rates of Great Lakes contract carriers are frozen for the 1951 iron ore shipping season at Jan 25 levels. The Office of Price Stabilization fixed the 1951 ceiling charges as the rates agreed upon in any contract entered into on or before Jan. 25. Contract movement of iron ore, limestone, and coal will be affected.

refractories ceilings—National Production Authority is considering DO ceilings for refractories manufacturers to prevent disruption of production schedules. Industry members reported that despite expansion, ranging from 10 to 30 pct, they still had to reject unrated orders from new customers.

pig iron imports—A record quantity of 738,383 gross tons of pig iron was imported by U. S. consumers from all sources last year. This was over eight times as much as was imported in 1949 and about 65 pct ahead of the previous record in 1926. The outlook for 1951 is not so bright, however.

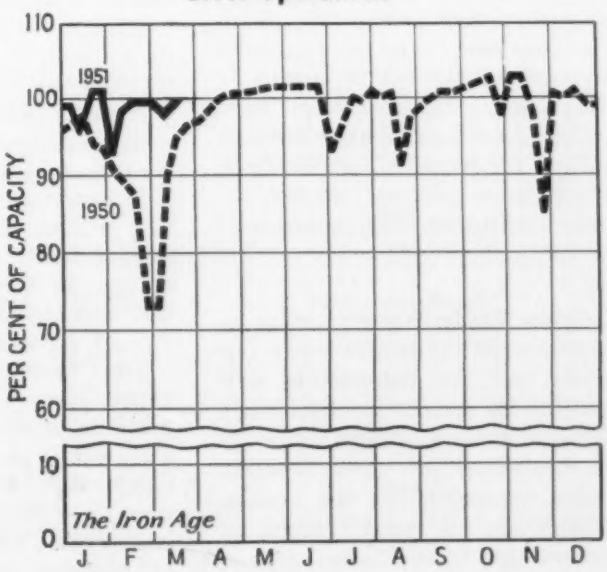
more pig iron—Construction will start this spring on Pittsburgh Coke & Chemical Co.'s 250,000-ton-a-year blast furnace at its Neville Island plant. The furnace will double the firm's capacity. A certificate of necessity for $9,150,000 covering part of the cost has been obtained.

restore car program—June allocation of steel for the freight car program is expected to be restored to the 310,000-tons-a-month level. NPA has received data confirming industry's claim that production is likely to hit the 10,000-cars-a-month goal by May. April allocations were cut to 288,000 tons because Jan.-Feb. output was barely past the 6000-a-month rate.

furnace trouble—Hanna Furnace Co. is beginning to have some furnace difficulties at Buffalo. Their silvery iron furnace and one of the three merchant furnaces will soon have to be blown out for relining. The furnaces will be pushed to the limit but when they do stop producing it will hurt the iron-shy foundries.

minimum needs—Minimum zinc and steel needs of makers of galvanized ware and enameled utensils will be reported to NPA by recently-named task groups of the industry. Present zinc supplies are insufficient to make full use of steel that is available, they say.

Steel Operations**



District Operating Rates—Per Cent of Capacity**

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	West	Buffalo	Cleveland	Detroit	Wheeling	South	Ohio River	St. Louis	East	Aggregate
Mar. 11	87.0	105.5	97.0*	99.0	103.2	104.0	98.0*	101.0*	100.0	102.5	90.0	97.2	111.0	99.0
Mar. 18	87.0	104.5	97.0	99.0	107.7	104.0	98.5	106.0	100.0	102.5	92.0	97.2	103.3	100.0

* Revised.
** Beginning Jan. 1, 1951, operations are based on an annual capacity of 104,229,650 net tons.

nonferrous metals

outlook and market activities

NONFERROUS METALS PRICES

	Mar. 14	Mar. 15	Mar. 16	Mar. 17	Mar. 19	Mar. 20
Copper, electro, Conn.	24.50	24.50	24.50	24.50	24.50	24.50
Copper, Lake delivered	24.625	24.625	24.625	24.625	24.625	24.625
Tin, Straits, New York	$1.34	$1.34	$1.34	....	$1.34	$1.34
Zinc, East St. Louis	17.50	17.50	17.50	17.50	17.50	17.50
Lead, St. Louis	16.80	16.80	16.80	16.80	16.80	16.80

Note: Quotations are going prices.

by R.Hatschek

Aluminum Ingot Boosted—Steadily advancing scrap prices last week, up 2¢ to 4¢ per lb, have forced aluminum ingot makers to boost the prices on their products by an average of about 1¢ per lb. In many cases the ingot makers are now charging the maximum allowable ceiling prices.

Generally, demand is running at a high level while raw material supplies are in an ever-worsening situation in regard to availability. The aluminum ingot makers have now joined others in calling for immediate action from Washington on the subject of price rollbacks for nonferrous scrap.

Scrap Trade Waits—Confusion continues in the nonferrous scrap trade and the industry is still waiting for definite word from the Office of Price Stabilization on the establishment of more specific price regulation for the metals. Meanwhile, all metals remain in exceedingly tight supply.

Heavy conversion demand for copper is at the root of the uncertainty but it is expected that the situation will at least partly clarify itself next month. Dealers point out, however, that it is very difficult to enforce the conversion regulations because junk looks like junk and its origin is impossible to determine in most cases.

Aluminum Shipments — Shipments of aluminum wrought products during January totaled 166 million lb as compared to 153 million lb for the previous month, according to Dept. of Commerce statistics. The Aluminum Association also reports a total production for January of 135,907,016 lb, an increase of over 4 million lb more in December.

If continued at this rate, aluminum production would reach better than 1.6 billion lb for 1951 but it is expected that actual production will be even higher because of new facilities coming into operation and higher output from reactivated plants.

Tin Prices—Reconstruction Finance Corp. continued its selling price as originally established at $1.34 per lb for grade A tin while Commodity Exchange business went on at 6¢ to 10¢ per lb higher last week. The Singapore market was higher and was the equivalent of $1.48 per lb c.i.f. New York on Monday.

National Production Authority has indicated that action will be taken to assure sufficient tin for perishable food containers. The steps will be (1) to increase by 12 pct the amount of pig tin available to tinplate manufacturers, (2) to give preference to canners of perishable foods, and (3) to more strictly curtail the supplies for non-essential containers such as beer cans.

Lead Imports Dip—Despite high demand, lead sales are continuing to drop in volume because of a drop in availability. The recent increase in the lead import tariff has acted to cut down imports to only 11,200 tons in January. When the tallies for February and March are ready, it is expected that the improvement will only be slight.

Washington Plans—OPS is expected momentarily to issue an order specifically controlling the price of both primary and secondary zinc. Primary metal is to be pegged at the prevailing 17.5¢ per lb for Prime Western zinc. It is supposed that importers will no longer be permitted to tack on the cost of the import duty on their selling prices.

There is also a plan under consideration by which the government would ship its copper and brass scrap, such as shell casings, to refineries under a toll arrangement. The Army will use steel cartridge cases to save copper and zinc.

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.188 in., 2S, 3S, 30.1¢; 4S, 61S-O, 32¢; 52S, 34.1¢; 24S-O, 24S-OAL, 32.9¢; 75S-O, 75S-OAL, 39.9¢; 0.081 in., 2S, 3S, 31.2¢; 4S, 61S-O, 33.5¢; 52S, 35.6¢; 24S-O, 24S-OAL, 34.1¢; 75S-O, 75S-OAL, 41.8¢; 0.032 in., 2S, 3S, 32.9¢; 4S, 61S-O, 37.1¢; 52S, 39.8¢; 24S-O, 24S-OAL, 41.7¢; 75S-O, 75S-OAL, 52.2¢.

Plate: ¼ in. and heavier: 2S, 3S-F, 28.3¢ 4S-F, 30.2¢; 52S-F, 31.8¢; 61S-O, 30.8¢; 24S-O, 24S-OAL, 32.4¢; 75S-O, 75S-OAL, 38.8¢.

Extruded Solid Shapes: Shape factors 1 to 5, 26.2¢ to 74.5¢; 12 to 14, 36.9¢ to 89¢; 24 to 36, 39.6¢ to $1.16; 36 to 38, 47.2¢ to $1.70.

Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 37.5¢ to 53.5¢; cold-finished, 0.375 to 3 in., 2S-F, 3S-F, 40.5¢ to 55¢.

Screw Machine Stock: Rounds, 11S-T3, ¼ to 11/32 in., 53.5¢ to 42¢; ⅜ to 1½ in., 41.5¢ to 39¢; 1 9/16 to 3 in., 38.5¢ to 36¢; 17S-T4 lower by 1.5¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in., 2S, 39.5¢ to 29¢; 52S, 48¢ to 35¢; 56S, 51¢ to 42¢; 17S-T4, 54¢ to 37.5¢; 61S-T4, 48.5¢ to 37¢; 75S-T6, 84¢ to 67.5¢.

Extruded Tubing, Rounds: 63S-T5, OD in in.: 1¼ to 2, 37¢ to 54¢; 2 to 4, 33.5¢ to 45.5¢; 4 to 6, 34¢ to 41.5¢; 6 to 9, 34.5¢ to 43.5¢.

Roofing Sheet, Flat: 0.019 in. x 28 in. per sheet, 72 in., $1.142; 96 in., $1.522; 120 in., $1.902; 144 in., $2.284. Gage 0.024 in. x 28 in., 72 in., $1.379; 96 in., $1.839; 120 in., $2.299; 144 in., $2.759. Coiled Sheet: 0.019 in. x 28 in., 28.2¢ per lb.; 0.024 in. x 28 in., 26.9¢ per lb.

Magnesium

(F.o.b. mill, freight allowed)

Sheet and Plate: FS1-O, ¼ in. 63¢; 3/16 in. 65¢; ⅛ in. 67¢; B & S Gage 10, 68¢; 12, 72¢; 14, 78¢; 16, 85¢; 18, 93¢; 20, $1.05; 22, $1.27; 24, $1.67. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., ¼ to 0.311 in., 74¢; ⅜ to ¾ in., 57.5¢; 1¼ to 1.749 in., 53¢; 2½ to 5 in., 48.5¢. Other alloys higher. Base: Up to ¾ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated, 0.10 to 0.11 lb, 3.5 in., 62.3¢; 0.22 to 0.25 lb, 5.9 in., 59.3¢; 0.50 to 0.59 lb, 8.6 in., 56.7¢; 1.8 to 2.59 lb, 19.5 in., 53.8¢; 4 to 4 lb, 28 in., 49¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ in. to 5/16, $1.40; 5/16 to ⅜, $1.26; ½ to ⅝, 93¢; 1 to 2 in., 76¢; 0.165 to 0.219, ⅝ to ¾, 61¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in in.: Up to 1½ in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheet and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $10; Bar, HR or forged, $6; Forgings, $6.

Nickel and Monel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel
Sheets, cold-rolled	71½	57
Strip, cold-rolled	77½	60
Rods and bars	67½	55
Angles, hot-rolled	67½	55
Plates	69½	56
Seamless tubes	100½	90
Shot and blocks	....	50

Copper, Brass, Bronze

(Freight prepaid on 200 lb includes duty)

	Sheets	Rods	Extruded Shapes
Copper	41.03	....	40.63
Copper, h-r	....	36.88	....
Copper, drawn	....	38.13	....
Low brass	39.15	38.84	....
Yellow brass	38.28	37.97	....
Red brass	40.14	39.83	....
Naval brass	43.08	38.61	38.07
Leaded brass	....	32.63	36.70
Com'l bronze	41.13	40.82	....
Mang. bronze	45.96	40.65	41.41
Phos. bronze	50.20	60.45	....
Muntz metal	40.43	36.74	37.99
Ni silver, 10 pct	49.27	51.49	....
Arch. bronze	....	....	35.11

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	19.00
Aluminum pig	18.00
Antimony, American, Laredo, Tex.	42.00
Beryllium copper, 3.75-4.25% Be	$1.56
Beryllium aluminum 5% Be, Dollars per lb contained Be	$69.00
Bismuth, ton lots	$2.25
Cadmium, del'd	$2.55
Cobalt, 97-99% (per lb)	$2.10 to $2.17
Copper, electro, Conn. Valley	24.50
Copper, Lake, delivered	24.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$200
Lead, St. Louis	16.80
Lead, New York	17.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb	24.50
Magnesium, sticks, 100 to 500 lb	42.00 to 44.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$216-$220
Nickel, electro, f.o.b. New York	53.55
Nickel oxide sinter, f.o.b. Copper Cliff, Ont., contained nickel	46.75
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$90 to $93
Silver, New York, cents per oz.	90.16
Tin, New York	$1.34
Titanium, sponge	$5.00
Zinc, East St. Louis	17.50
Zinc, New York	18.22
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115	29.00
No. 120	28.50
No. 123	28.00
80-10-10 ingot	
No. 305	35.00
No. 315	32.00
88-10-2 ingot	
No. 210	47.50
No. 215	44.50
No. 245	37.00
Yellow ingot	
No. 405	25.50
Manganese bronze	
No. 421	32.75

Aluminum Ingot

(Cents per lb, 30,000 lb lots)

95-5 aluminum-silicon alloys	
0.30 copper, max.	34.00-35.00
0.60 copper, max.	33.75-34.75
Piston alloys (No. 122 type)	31.50-32.00
No. 12 alum. (No. 2 grade)	30.25-31.25
108 alloy	31.50-32.00
195 alloy	32.50-33.00
13 alloy	34.00-35.00
ASX-679	31.50-32.00

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	32.50-33.50
Grade 2—92-95%	31.50-32.50
Grade 3—90-92%	30.50-31.50
Grade 4—85-90%	29.50-30.50

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	39⅛
Electrodeposited	33⅜
Rolled, oval, straight, delivered	38⅞
Forged ball anodes	43
Brass, 80-20	
Cast, oval, 15 in. or longer	34¾
Zinc, oval	26½
Ball anodes	25½
Nickel 99 pct plus	
Cast	70.50
Rolled, depolarized	71.50
Cadmium	$2.80
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	79½

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	52.15
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	20½
Nickel chloride, 375 lb drum	27½
Silver syanide, 100 oz lots, per oz.	67¼
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drums	45.85

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	23	22¼
Yellow Brass	20½	18⅝
Red brass	21½	20¾
Comm. bronze	21⅝	21
Mang. bronze	19½	18⅝
Brass rod ends	19⅞	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	21.50
No. 2 copper wire	20.00
Light copper	19.00
Refinery brass	19.50*
Radiators	15.00

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

No. 1 copper wire	26.00-27.00
No. 2 copper wire	24.00-24.50
Light copper	22.50-23.00
No. 1 composition	24.00-24.50
No. 1 comp. turnings	23.50-24.00
Rolled brass	19.00
Brass pipe	20.50
Radiators	18.50-19.00
Heavy yellow brass	18.50-19.00

Aluminum

Mixed old cast	20 —21
Mixed new clips	23 —24
Mixed turnings, dry	20½—21
Pots and pans	20½—21
Low copper	25

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	23½
No. 2 heavy copper and wire	22
Light copper	20
New type shell cuttings	20
Auto radiators (unsweated)	16½—17
No. 1 composition	20 —21
No. 1 composition turnings	19 —20
Clean red car boxes	18 —18½
Cocks and faucets	18 —18½
Mixed heavy yellow brass	15½—16
Old rolled brass	18 —18½
Brass pipe	19 —19½
New soft brass clippings	17½—18
Brass rod ends	16½—17
No. 1 brass rod turnings	16 —16½

Aluminum

Alum. pistons and struts	12 —13
Aluminum crankcases	15½—16
2S aluminum clippings	19 —19½
Old sheet and utensils	15½—16
Borings and turnings	12 —13
Misc. cast aluminum	15½—16
Dural clips (24S)	15½—16

Zinc

New zinc clippings	16 —17
Old zinc	11 —12
Zinc routings	8½— 9
Old die cast scrap	8 — 8½

Nickel and Monel

Pure nickel clippings	90 —100
Clean nickel turnings	80 —90
Nickel anodes	90 —100
Nickel rod ends	90 —100
New Monel clippings	30 —35
Clean Monel turnings	20 —25
Old sheet Monel	25 —30
Inconel clippings	30 —35
Nickel silver clippings, mixed	16 —18
Nickel silver turnings, mixed	15 —16

Lead

Soft scrap, lead	15⅛—15¾
Battery plates (dry)	9 — 9½

Magnesium

Segregated solids	9 —10
Castings	5½— 6½

Miscellaneous

Block tin	95 —100
No. 1 pewter	80 —85
No. 1 auto babbitt	75 —80
Mixed common babbitt	12¼—12½
Solder joints	23 —24
Siphon tops	75 —80
Small foundry type	18¼—18½
Monotype	16¾—17
Lino. and stereotype	16½—16¾
Electrotype	15 —15½
Hand picked type shells	11½—11¾
Lino. and stereo. dross	8¾— 9
Electro. dross	6¾— 7

SCRAP *iron and steel*

markets
prices
trends

Scrap shortage shows no sign of waning . . . It may get worse . . . Openhearth shutdowns seen possible . . . Allocations hit Chcago.

Steelmaking centers are sources of bad tidings as the scrap shortage shows no sign of waning and many suspect that it will get worse. With rearmament as an urgent stimulus, the steelmaking rate won't drop unless it's batted down by depletion of scrap inventories. At the present unfavorable ratio of collections to consumption, shutting down of some openhearths is seen as a definite possibility.

Chicago, which was considered comparatively well-stocked, has been a target area for the NPA allocation system and steel men there anticipate an acute shortage within a month or two. Its scrap has been leaving for more critical areas but NPA has tried to reassure the Chicago market with pledges of allocations when needed.

It is reported less scrap is coming from railroads because they are hanging on to rolling stock while waiting for the carbuilding program to get rolling.

Chicago mills are objecting to heightened freight rates that result from cross-hauling. Some mills have gone far afield for scrap—as far as Texas. Others are reportedly putting a top on the springboard they will pay.

Detroit is debating whether or not its price for No. 1 heavy melting is $40.20 or $39.05.

PITTSBURGH — Indications are the scrap shortage will get worse. Reasons include: (1) Prospects that melting operations will continue at high levels; (2) Expansion of melting facilities; (3) Less scrap from railroads due to urgency of car shortage, reflected in patching up of cars that might ordinarily be scrapped; (4) Decline in scrapping of steam locomotives; (5) Prospects of less scrap from automobile companies while converting to defense production. Scrap stocks also are said to be distributed inequitably due to heavy buying by some consumers before price controls went into effect. Upgrading reportedly is increasing here. There is growing speculation on when OPS will set up an inspection system. Reported under consideration is a plan to establish inspectors at railroad junction points.

CHICAGO—Scrap inventories of some major mills in the area are from moderate to low. An acute shortage is expected within 30 to 60 days because of the rate at which NPA is allocating Chicago dealer scrap out of the area to the Ohio district, eastern plants and the St. Louis area. Consumers here have been reassured by NPA that if inventories start to drop alarmingly they will receive allocations. However mills object because of increased freight rates resulting from cross hauling. Some mills in the area are taking scrap out of points as far away as Texas. Other mills are said to be limiting the amount of springboard they will pay.

PHILADELPHIA—The scrap shortage is really getting bad. Some say it is only a matter of time before some openhearths will have to be shut down for lack of scrap. The foundry situation is doubly bad because they are forced to melt a terrific percentage of scrap. Two contributing factors are (1) that plants are hesitant to scrap old equipment because they fear that they cannot replace it and (2) junk collectors are not interested in iron and steel because waste paper brings in higher profit.

NEW YORK—The market here moved at last week's pallbearer's gait while brokers played all the angles to get steel scrap and cast to mills and foundries. Some of the pleas were heart-touching. But as one broker put it: "plug up one gap and another larger one appears." Cast is particularly tight in this area because of its many foundries. Many of these are operating on the truckloads that come in through the gate. Allocations are reportedly confused and inadequate because mills get only a small fraction of what they ask for. Cross hauling is a natural result of allocations and some squirm at additional freight charges.

DETROIT—The confused scrap situation in Detroit continues while debate rages as to whether $40.20 or $39.05 is the official Detroit price of No. 1 scrap. Some local brokers have been requested to change their invoice prices but it appears little price revising will be done until Washington and Detroit offices of OPS agree on a price. Meanwhile, shipments of scrap have slowed to a walk. The trade is concerned as to the extent seasonal factors or price regulations may be obscuring what could be a long-time scrap shortage in this area.

CLEVELAND—Scrap is tight here and in the Valley. Shipments are improving slowly but they must increase materially before mills will start to break even on consumption. Indications are the allocation picture will worsen. Foundries are scrambling for tonnage and some are uncomfortably close to reduced operations. Weather is holding back the yards, and it is hoped spring will see some farm and auto wrecking tonnage move into the market.

BIRMINGHAM — The scrap situation here is still in bad shape and foundries and specialty users are trying to get supplies from sources as far away as Texas. Very little scrap of any kind is moving into the district, cast of all grades being particularly scarce, and stockpiles are dwindling rapidly toward the vanishing point. Florida, which has been a good supplier, seems to have sold everything available prior to the price rollback.

CINCINNATI — Consumers here were pinched for tonnages this week as shipments failed to keep pace with consumption. Foundries are hard hit, and some major consumers of these grades are on a car-to-cupola basis. Cast is very scarce. Yards have been working, but weather has halted most activity. Mills have received some allocations directly from railroads, but the entire market is crying for tonnage.

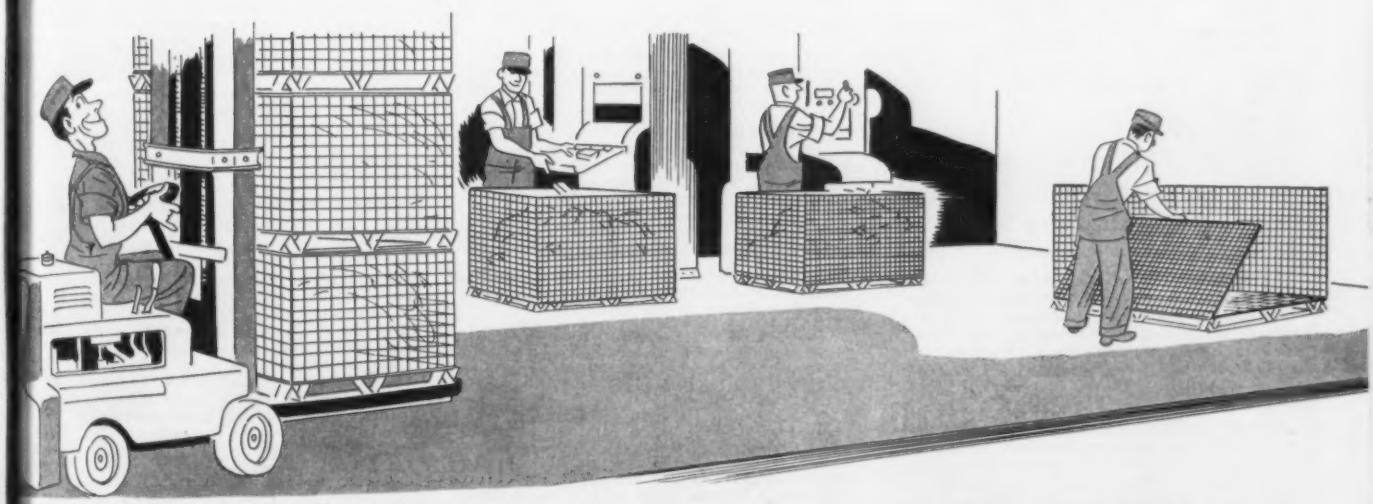
BOSTON—Scrap movement is slowing noticeably here. Cast grades are harder to get, and movement of No. 1 heavy melting is below normal.

BUFFALO—Mills are still drawing from reserves to maintain production. Midwest scrap has been allocated for consumption here. Better weather brought only a slight pick up in receipts at dealers' yards which had started layoffs and a 5-day week.

Way Back in the Clumsy Days B.C.*

* BC (before Cargotainers)—the original patented, palletized welded wire containers—plants expended countless man-hours transferring parts and goods from car to storage to assembly in an endless number of operations like this:

Now! In these enlightened days AC (after Cargotainers) parts and goods are shipped, visably stacked and stored, and moved to assembly or intermediate treatment without removal from sturdy Cargotainers. Then each unit is collapsed flat for easy return to vendor. It all happens like this:



If by some chance, you are still BC why not let a Pittsburgh Materials-Handling Engineer show you how other plants have saved man-hours and storage space and increased efficiency by joining the AC trend. Write today to Dept. FM, Pittsburgh Steel Products Company, Grant Building, Pittsburgh 30, Pa.

CARGOTAINERS

by Pittsburgh Steel Products Company

A Subsidiary of Pittsburgh Steel Company

Iron and Steel SCRAP PRICES

(Maximum basing point prices, per gross ton, as set by OPS, effective Feb. 7, 1951. Shipping point and delivered prices calculated as shown below.)

Switching Charge (Dollars per gross ton) →	$0.99 .75 .53 .65 .75 .51 .75	.75 .51 .51 .75 .70	.76 .83 .68 .26	1.34 .79 .50 .20 .51 .51	.20 .62 .47 .51 .51	.51	.95 .50	.78	.50 .43 .51	.33	.57	.66 .65 .52 .69 .69
Basing Points →	Pittsburgh, Johnstown, Brackenridge, Butler, Midland, Monessen, Sharon	Youngstown, Canton, Steubenville, Warren, Weirton	Cleveland, Buffalo, Cincinnati, Middletown	Chicago, Claymont, Coatesville, Conshohocken, Harrisburg, Phoenixville	Sparrows Pt., Bethlehem, Ashland, Ky., Kokomo, Ind., Portsmouth, O.	St. Louis	Detroit, Duluth	Kansas City	Birmingham, Alabama City, Atlanta	Minnequa	Houston	Los Angeles, Pittsburg, Cal., Portland, Ore., San Francisco
GRADES OPS No.												
No. 1 heavy melting 1	$44.00	$44.00	$43.00	$42.50	$42.00	$41.00	$40.00	$39.50	$39.00	$38.00	$37.00	$35.00
No. 2 heavy melting 2	42.00	42.00	41.00	40.50	40.00	39.00	38.00	37.50	37.00	36.00	35.00	33.00
No. 1 busheling 3	44.00	44.00	43.00	42.50	42.00	41.00	40.00	39.50	39.00	38.00	37.00	35.00
No. 1 bundles 4	44.00	44.00	43.00	42.50	42.00	41.00	40.00	39.50	39.00	38.00	37.00	35.00
No. 2 bundles 5	41.00	41.00	40.00	39.50	39.00	38.00	37.00	36.50	36.00	35.00	34.00	32.00
Machine shop turnings 6	34.00	34.00	33.00	32.50	32.00	31.00	30.00	29.50	29.00	28.00	27.00	25.00
Mixed borings and turnings 7	38.00	38.00	37.00	36.50	36.00	35.00	34.00	33.50	33.00	32.00	31.00	29.00
Shoveling turnings 8	38.00	38.00	37.00	36.50	36.00	35.00	34.00	33.50	33.00	32.00	31.00	29.00
Cast iron borings 10	38.00	38.00	37.00	36.50	36.00	35.00	34.00	33.50	33.00	32.00	31.00	29.00
No. 1 chemical borings 26	41.00	41.00	40.00	39.50	39.00	38.00	37.00	36.50	36.00	35.00	34.00	32.00
Forge crops 11	51.50	51.50	50.50	50.00	49.50	48.50	47.50	47.00	46.50	45.50	44.50	42.50
Bar crops and plate 12	49.00	49.00	48.00	47.50	47.00	46.00	45.00	44.50	44.00	43.00	42.00	40.00
Punchings and plate 14	46.50	46.50	45.50	45.00	44.50	43.50	42.50	42.00	41.50	40.50	39.50	37.50
Electric furnace bundles 15	46.00	46.00	45.00	44.50	44.00	43.00	42.00	41.50	41.00	40.00	39.00	37.00
Cut struct., plate, 3 ft and less 16	47.00	47.00	46.00	45.50	45.00	44.00	43.00	42.50	42.00	41.00	40.00	38.00
Cut struct., plate, 2 ft and less 17	49.00	49.00	48.00	47.50	47.00	46.00	45.00	44.50	44.00	43.00	42.00	40.00
Cut struct., plate, 1 ft and less 18	50.00	50.00	49.00	48.50	48.00	47.00	46.00	45.50	45.00	44.00	43.00	41.00
Foundry steel, 2 ft and less 20	46.00	46.00	45.00	44.50	44.00	43.00	42.00	41.50	41.00	40.00	39.00	37.00
Foundry steel, 1 ft and less 21	48.00	48.00	47.00	46.50	46.00	45.00	44.00	43.50	43.00	42.00	41.00	39.00
Heavy turnings 24	43.00	43.00	42.00	41.50	41.00	40.00	39.00	38.50	38.00	37.00	36.00	34.00
No. 1 RR heavy melting RR 1	46.00	46.00	45.00	44.50	44.00	43.00	42.00	41.50	41.00	40.00	39.00	37.00
Scrap rails, random lengths RR 14	48.00	48.00	47.00	46.50	46.00	45.00	44.00	43.50	43.00	42.00	41.00	39.00
Scrap rails, 3 ft and less RR 16	51.00	51.00	50.00	49.50	49.00	48.00	47.00	46.50	46.00	45.00	44.00	42.00
Scrap rails, 2 ft and less RR 17	52.00	52.00	51.00	50.50	50.00	49.00	48.00	47.50	47.00	46.00	45.00	43.00
Scrap rails, 18 in. and less RR 18	54.00	54.00	53.00	52.50	52.00	51.00	50.00	49.50	49.00	48.00	47.00	45.00
Rerolling rails RR 15	53.00	53.00	52.00	51.50	51.00	50.00	49.00	48.50	48.00	47.00	46.00	44.00
Uncut tires RR 20	48.00	48.00	47.00	46.50	46.00	45.00	44.00	43.50	43.00	42.00	41.00	39.00
Cut tires RR 21	51.00	51.00	50.00	49.50	49.00	48.00	47.00	46.50	46.00	45.00	44.00	42.00
Cut bolsters and side frames RR 23	49.00	49.00	48.00	47.50	47.00	46.00	45.00	44.50	44.00	43.00	42.00	40.00
RR specialties RR 24, 28, 29	51.00	51.00	50.00	49.50	49.00	48.00	47.00	46.50	46.00	45.00	44.00	42.00
Solid steel axles RR 25	58.00	58.00	57.00	56.50	56.00	55.00	54.00	53.50	53.00	52.00	51.00	49.00
No. 3 steel wheels RR 27	51.00	51.00	50.00	49.50	49.00	48.00	47.00	46.50	46.00	45.00	44.00	42.00

Cast Scrap

(F.o.b. all shipping points)

Grades	OPS No.	
Cupola cast	1	$49.00
Charging box cast	2	47.00
Heavy breakable cast	3	45.00
Cast iron brake shoes	5	41.00
Stove plate	6	46.00
Clean auto cast	7	52.00
Unstripped motor blocks	8	43.00
Cast iron carwheels	9	47.00
Malleable	10	55.00
Drop broken mach'y. cast	11	52.00

Boston, unstripped motor blocks....$38 to $39

SWITCHING DISTRICTS—These basing points include the indicated switching districts: Pittsburgh; Bessemer, Homestead, Duquesne, Munhall. Cincinnati; Newport. St. Louis; Granite City, East St. Louis, Madison. San Francisco; South San Francisco, Niles, Oakland. Claymont; Chester. Chicago; Gary. Los Angeles; Firestone.

SHIPPING POINT PRICES (Except RR scrap)—For shipping points within basing points, the ceiling shipping point price is the basing point price, less switching charge. The ceiling for shipping points outside basing points is the basing point price yielding the highest shipping point price, less the lowest established freight charge. Dock charge, where applicable, is $1.25 per gross ton except: Memphis, 95¢; Great Lakes ports, $1.50, and New England ports, $1.75. Maximum shipping point price on No. 1 heavy melting steel in New York City is $36.99 per gross ton with set differentials for other grades. Hudson and Bergen County, N. J., shipping point prices are computed from Bethlehem basing point. All New Jersey computations use all-rail transport. Ceiling need not fall below $32 per gross ton for No. 1 heavy melting steel, with set differentials for other grades. Cast scrap shipping point prices are given in table.

DELIVERED PRICES (RR scrap)—Ceiling on-line price of a RR operating in a basing point is the top in the highest priced basing point in which the RR operates. For off-line prices, RR's not operating in basing point, non-operating RR's, and RR scrap sold by someone other than a RR see text of order, THE IRON AGE, Feb. 8, 1951, p. 137-C.

DELIVERED PRICES (Except RR scrap)—Ceiling is the shipping point price plus actual freight charge, tax included. Dock charges, where applicable, are as above.

UNPREPARED SCRAP—Ceiling price is $8 a ton less than prepared base grades (No. 1 heavy & No. 1 RR heavy). Scrap suitable for compressing into No. 1 bundles is $6 less than No. 1 bundles; suitable for compressing into No. 2 bundles, $8 less than No. 2 bundles. For cast material requiring special preparation, price is breakable cast less preparation costs.

COMMISSIONS—Brokers are permitted a maximum of $1 per gross ton commission which must be separate on the bill.

ALLOY PREMIUMS—These alloy extras are permitted: **Nickel**; $1.25 may be added to price of No. 1 heavy for each 0.25 pct nickel between 1 and 5.25 pct. **Molybdenum**; $2 may be added to price of No. 1 heavy for molybdenum over 0.15 pct, $3 for content over 0.65 pct. **Manganese**; $4 may be added to price of No. 1 heavy or No. 1 RR heavy for content over 10 pct if scrap is in sizes over 8 x 12 x 24 in., $14 if less than 8 x 12 x 24 in. Manganese premium applicable only if sold for electric furnace use or on NPA allocation. **Silicon**; electric furnace and foundry grade adjustments are not applicable if silicon content is between 0.5 and 1.75 pct. **Chromium**; $1 may be added if scrap conforms to SAE 52100 analysis and is to be used in an electric furnace. In no case is price to exceed No. 1 heavy by more than $1. **Multiple Alloys**; if scrap contains two premium alloy elements, total premium may not exceed ceiling premium for any one contained alloy.

RESTRICTIONS ON USE—Ceiling prices on some scrap items may fluctuate with use by consumers. If some scrap is purchased for its established specialized use, the ceiling price set in the order stands. But if some special grades are purchased for other uses, the ceiling price charge shall be the price of the scrap grade being substituted. For example, the price established for Grade 28 (wrought iron) may be charged only when sold to a producer of wrought iron. Otherwise the ceiling price shall not exceed the ceiling price for the corresponding grade of basic openhearth. Restrictions on use are placed on the following grades: Chemical borings, wrought iron and rerolling rails. Ceiling prices on billet bloom and forge crops, alloy-free turnings, and heavy turnings may be charged only when shipped directly from industrial producer. NPA prohibits openhearth users from buying electric furnace grades, Nos. 11 through 18, foundry grades, Nos. 20 and 21 and cast grades, 1, 7, 9 and 11.

CEILING INTRANSIT PREPARATION CHARGES (Dollars per gross ton)

No. 1 heavy; No. 2 heavy; No. 1 RR heavy; No. 2 RR heavy; No. 1 busheling; No. 2 bundles; electric furnace bundles	$ 8.00
No. 1 bundles; briquetted turnings or cast iron borings; No. 1 RR sheet scrap	6.00
Crushing machine shop turnings	3.00
Bar crops and plate; punchings and plate; structural and plate, 1 ft & less, and 3 ft and less; foundry steel, 1 ft & less and 2 ft & less; wrought iron	10.00
Rails, 3 ft & less; cut tires; cut bolsters & side frames	4.00
Rails, 2 ft & less	5.00
Rails, 18 in. & less	7.00

Hamilton, Ontario

(Consumers buying prices, del'd gross ton)

Hvy. melting steel	$30.00
No. 1 bundles	30.00
No. 2 bundles	29.50
Mechanical bundles	28.00
Mixed, steel scrap	26.00
Rails, remelting	30.00
Rails, rerolling	33.00
Bushelings	24.50
Bushelings, prepared new factory	28.00
Bushelings, unprepared new factory	23.00
Short steel turnings	23.00
Mixed borings, turnings	23.00
Cast scrap	48.00 to 50.00

SCRAP

for your every requirement

LURIA BROTHERS AND COMPANY, INC.

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CLEVELAND, OHIO
1022 Midland Bldg.

LEBANON, PENNA.
Luria Building

PUEBLO, COLORADO
334 Colorado Bldg.

BUFFALO, N. Y.
Genesee Building

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100 Park Avenue

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ST. LOUIS, MISSOURI
2110 Railway Exchange Bldg.

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Pacific Gas & Elec. Co., Bldg.

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Berman

Comparison of Prices

Steel prices in this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel: (cents per pound)	Mar.20, 1951	Mar. 13, 1951	Feb. 20, 1951	Mar. 21 1950
Hot-rolled sheets	3.60	3.60	3.60	3.35
Cold-rolled sheets	4.35	4.35	4.35	4.10
Galvanized sheets (10 ga)	4.80	4.80	4.80	4.40
Hot-rolled strip	3.50	3.50	3.50	3.25
Cold-rolled strip	4.75	4.75	4.75	4.21
Plate	3.70	3.70	3.70	3.50
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R-strip (No. 302)	36.50	36.50	36.50	33.00
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes.	$7.50	$7.50	$7.50	$7.50
Tinplate, electro (0.50 lb)	6.60	6.60	6.60	6.60
Special coated mfg. ternes	6.35	6.35	6.35	6.50
Bars and Shapes: (cents per pound)				
Merchant bars	3.70	3.70	3.70	3.45
Cold finished bars	4.55	4.55	4.55	*4.145
Alloy bars	4.30	4.30	4.30	3.95
Structural shapes	3.65	3.65	3.65	3.40
Stainless bars (No. 302)	31.25	31.25	31.25	28.50
Wrought iron bars	9.50	9.50	9.50	9.50
Wire: (cents per pound)				
Bright wire	4.85	4.85	4.85	4.50
Rails: (dollars per 100 lb)				
Heavy rails	$3.60	$3.60	$3.60	$3.40
Light rails	4.00	4.00	4.00	3.75
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$56.00	$56.00	$56.00	$54.00
Slabs, rerolling	56.00	56.00	56.00	54.00
Forging billets	66.00	66.00	66.00	63.00
Alloy blooms billets, slabs	70.00	70.00	70.00	66.00
Wire Rod and Skelp: (cents per pound)				
Wire rods	4.10	4.10	4.10	3.85
Skelp	3.35	3.35	3.35	3.15

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*

Pig Iron: (per gross ton)	Mar.20, 1951	Mar. 13, 1951	Feb. 20, 1951	Mar. 21 1950
No. 2 foundry, del'd Phila.	$57.77	$57.77	$57.77	$50.42
No. 2, Valley furnace	52.50	52.50	52.50	46.50
No. 2, Southern Cin'ti	55.58	55.58	55.58	49.08
No. 2, Birmingham	48.88	48.88	48.88	42.38
No. 2, foundry, Chicago†	52.50	52.50	52.50	46.50
Basic del'd Philadelphia	56.92	56.92	56.92	49.92
Basic, Valley furnace	52.00	52.00	52.00	46.00
Malleable, Chicago†	52.50	52.50	52.50	46.50
Malleable, Valley	52.50	52.50	52.50	46.50
Charcoal, Chicago	70.56	70.56	70.56	68.56
Ferromanganese‡	186.25	186.25	186.25	173.40

†The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡Average of U. S. prices quoted on Ferroalloy page.

Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$44.00*	$44.00*	$44.00*	$32.25
No. 1 steel, Phila. area	42.50*	42.50*	42.50*	24.50
No. 1 steel, Chicago	42.50*	42.50*	42.50*	28.50
No. 1 bundles, Detroit	40.00*	40.00*	40.00*	25.50
Low phos. Young'n	46.50*	46.50*	46.50*	32.75
No. 1 cast, Pittsburgh	49.00†	49.00†	49.00†	39.50
No. 1 cast, Philadelphia	49.00†	49.00†	49.00†	36.50
No. 1 cast, Chicago	49.00†	49.00†	49.00†	39.50

*Basing Pt. †Shipping Pt.
Not including broker's fee after Feb. 7, 1951.

Coke: Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.75	$14.25	$14.25	$14.25
Foundry coke, prompt	17.75	17.25	17.25	16.25

Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro, Conn.	24.50	24.50	24.50	18.50
Copper, Lake, Conn.	24.625	24.625	24.625	18.625
Tin, Straits, New York	$1.34	$1.34	$1.83	77.25
Zinc, East St. Louis	17.50	17.50	17.50	10.00
Lead, St. Louis	16.80	16.80	16.80	10.30
Aluminum, virgin	19.00	19.00	19.00	17.00
Nickel, electrolytic	53.55	53.55	53.55	42.97
Magnesium, ingot	24.50	24.50	24.50	20.50
Antimony, Laredo, Tex.	42.00	42.00	42.00	24.50

Composite Prices

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 130 of May 12, 1949, issue.)

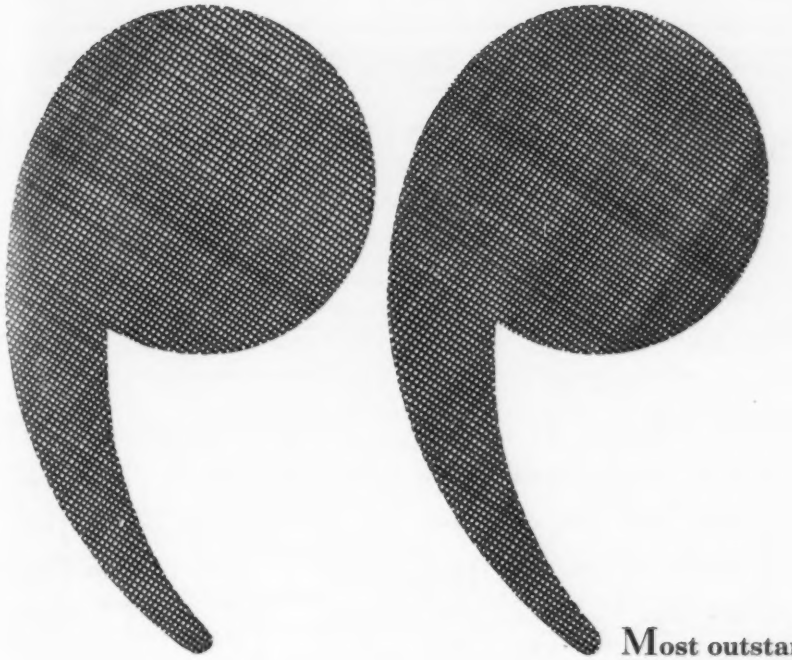
	Finished Steel Base Price	Pig Iron	Scrap Steel
Mar. 20, 1951	4.131¢ per lb.	$52.69 per gross ton	$43.00 per gross ton
One week ago	4.131¢ per lb.	52.69 per gross ton	43.00 per gross ton
One month ago	4.131¢ per lb.	52.69 per gross ton	43.00 per gross ton
One year ago	3.837¢ per lb.	46.38 per gross ton	28.42 per gross ton

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Scrap Steel High	Scrap Steel Low
1951	4.131¢ Jan. 2	4.131¢ Jan. 2	$52.69 Jan. 2	$52.69 Jan. 2	$47.75 Jan. 30	$43.00 Feb. 7
1950	4.131¢ Dec. 1	3.837¢ Jan. 3	52.69 Dec. 12	45.88 Jan. 3	45.13 Dec. 19	26.25 Jan. 3
1949	3.837¢ Dec. 27	3.3705¢ May 3	46.87 Jan. 18	45.88 Sept. 6	43.00 Jan. 4	19.33 June 28
1948	3.721¢ July 27	3.193¢ Jan. 1	46.91 Oct. 12	39.58 Jan. 6	43.16 July 27	39.75 Mar. 9
1947	3.193¢ July 29	2.848¢ Jan. 1	37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28	29.50 May 20
1946	2.848¢ Dec. 31	2.464¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
1945	2.464¢ May 29	2.396¢ Jan. 1	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
1944	2.396¢	2.396¢	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.396¢	2.396¢	23.61	23.61	$19.17	$19.17
1942	2.396¢	2.396¢	23.61	23.61	19.17	19.17
1941	2.396¢	2.396¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	32.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1932	1.89196¢ July 5	1.83910¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 3

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.



Most outstanding increase in steel-making capacity in the West (since World War II) has been that of the Kaiser Fontana plant . . .

THAT quotation from *Iron Age*, authoritative journal of the steel industry, is confirmed by these facts:

Kaiser Steel has increased ingot production from 553,000 tons in 1944 to an estimated 1,380,000 tons for 1951—more than twice the production of the peak war year!

Equally important is the diversification which has taken place in the past nine years. Kaiser Steel now makes the following products which were not produced in the seven western states prior to World War II: Plates, continuous weld pipe, electric weld pipe, cold rolled strip and sheet, alloy bars, and certain sizes of structural shapes.

Today, when more steel is vitally needed, Kaiser Steel continues its program of further expansion.

This constant growth is another reason why the West Coast's only integrated *independent* steel plant is bringing more industry, more jobs, more wealth to the West!

It's good business to do business with

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IRON AGE

STEEL PRICES

Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page.
Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.

	Pittsburgh	Chicago	Gary	Cleveland	Canton Massillon	Middletown	Youngstown	Bethlehem	Buffalo	Conshohocken	Johnstown	Sparrows Point	Granite City	Detroit
INGOTS Carbon forging, net ton	$52.00[1]													
Alloy, net ton	$54.00[1,17]													$54.00[11]
BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton	$56.00[1,5]	$56.00[1]	$56.00[1]						$56.00[3]		$56.00[3]			
Carbon forging billets, net ton	$66.00[1,5]	$68.00[1,4]	$66.00[1]	$66.00[4]	$66.00[4]				$66.00[3,4]	$73.00[26]	$66.00[3]			$69.00[11]
Alloy, net ton	$70.00[1,17,6]	$70.00[1,4]	$70.00[1,5]		$70.00[4]			$70.00[3]	$70.00[3,4]	$77.00[26]	$70.00[3]			$73.00[11]
PIPE SKELP	3.35[1] 3.45[5]						3.35[1,4]							
WIRE RODS	4.10[3] 4.30[18]	4.10[3,4,33]	4.10[6]	4.10[3]			4.10[6]		4.10[35]		4.10[3]	4.20[3]		
SHEETS Hot-rolled (18 ga. & hvr.)	3.60[1,5,9,15] 3.75[28]	3.60[6,23]	3.60[1,5,8]	3.60[4,5]		3.60[7]	3.60[1,4,6] 4.00[13]		3.60[3]	4.00[26]		3.60[3]	4.30[22]	3.80[12] 4.40[47]
Cold-rolled	4.35[1,5,9,15.7]		4.35[1,6,8]	4.35[4,5]		4.35[7]	4.35[4,6]		4.35[3]			4.35[3]	5.05[22]	4.55[12]
Galvanized (10 gage)	4.80[1,9,15]		4.80[1,8]		4.80[4]	4.80[7]	5.50[44] 6.00[64]					4.80[3]	5.50[22]	
Enameling (12 gage)	4.65[1]		4.65[1,8]	4.65[4]		4.65[7]	4.65[6]						5.35[22]	
Long terne (10 gage)	5.20[9,15]		5.20[1]			5.20[7]	6.00[64]							
Hi str. low alloy, h.r.	5.40[1,5] 5.75[9]	5.40[1]	5.40[1,8] 5.90[6]	5.40[4,5]			5.40[1,4,13] 5.90[6]		5.40[3]	5.65[26]		5.40[3]		5.95[12]
Hi str. low alloy, c.r.	6.55[1,5] 6.90[9]		6.55[1,8] 7.05[6]	6.55[4,5]			6.55[4] 7.05[6]		6.55[3]			6.55[3]		7.10[12]
Hi str. low alloy, galv.	7.20[1]											6.75[3]		
STRIP Hot-rolled	3.60[9], 4.00[41,59], 3.75[28] 3.50[5,7]	3.50[66]	3.50[1,6,8]			3.50[7]	3.50[1,4,6] 4.00[13]		3.50[3,4]	3.90[26]	3.50[3]	3.50[3]		4.40[47] 3.80[12]
Cold-rolled	4.65[5,7,9] 5.00[28] 5.35[40,63,65]	4.90[5,66]	4.90[6]	4.65[2,5]		4.65[7]	4.65[4,6] 5.25[48,49] 5.35[13,49]		4.65[3]			4.65[3]		4.85[12] 5.45[47] 5.80[64,81]
Hi str. low alloy, h.r.	5.75[9]		5.50[1] 5.30[6], 5.80[6]				4.95[4], 5.50[1] 5.40[13] 5.80[6]		4.95[3]	5.55[26]		4.95[3]		5.95[12]
Hi str. low alloy, c.r.	7.20[9]			6.55[3] 6.70[6]			6.20[4] 6.55[13] 7.05[6]		6.40[3]			6.40[3]		
TINPLATE† Cokes, 1.25-lb base box (1.50 lb. add 25¢)	$8.45[1,5,9,15]		$8.45[1,6,8]				$8.45[4]					$8.55[3]		
Electrolytic 0.25, 0.50, 0.75 lb box	0.25 lb. base box, $7.15[1,4,5,6,9]; $7.25[3,11]; $7.35[22] 0.50 lb., add 25¢; 0.75 lb. add 65¢													
BLACKPLATE, 29 gage Hollowware enameling	5.85[1] 6.15[18]		5.85[1]				5.30[4]							
BARS Carbon steel	3.70[1,5] 3.85[9]	3.70[1,4,23]	3.70[1,4,6,8]	3.70[4]	3.70[4]		3.70[1,4,6]		3.70[3,4]		3.70[3]			3.85[11]
Reinforcing	3.70[1,5]	3.70[4]	3.70[1,6,8]	3.70[4]			3.70[1,4,6]		3.70[3,4]		3.70[3]	3.70[3]		
Cold-finished	4.55[2,4,5,52,69,71]	4.55[2,23,70]	4.55[4,74,75]	4.55[3]	4.55[4,52]		4.55[5,57]		4.60[70]					4.70[54]
Alloy, hot-rolled	4.30[1,17]	4.30[1,4,33]	4.30[1,6,8]		4.30[4]		4.30[1,6]	4.30[3]	4.30[3,4]		4.30[3]			4.40[11] 4.65[13]
Alloy, cold-drawn	5.40[17,52,69,71,2]	5.40[4,23,69,70,73] 5.45[2]	5.40[4,73,74]		5.40[4,52]		5.40[5,25,57]	5.40[3]	5.40[3]					5.55[54]
Hi str. low alloy, h.r.	5.55[1,5]		5.55[1,8] 6.05[6]	5.55[4,5]			5.55[1] 6.05[6]	5.55[3]	5.55[3]		5.55[3]			
PLATE Carbon steel	3.70[1,5,15] 4.00[9]	3.70[1,23]	3.70[1,6,8]	3.70[4,5]			3.70[1,4,6] 3.95[13]		3.70[3]	4.15[26]	3.70[3]	3.70[3]	4.40[22]	
Floor plates	4.75[1]	4.75[1]	4.75[3]	4.75[3]						4.75[26]				
Alloy	4.75[1]	4.75[1]	4.75[1]				5.20[13]			5.05[26]	4.75[3]	4.75[3]		
Hi str. low alloy	5.65[1,5]	5.65[1]	5.65[1,8] 6.15[6]	5.65[4,5]			5.65[4] 5.70[13] 6.15[6]			5.90[26]	5.65[3]	5.65[3]		
SHAPES, Structural	3.65[1,5] 3.90[9]	3.65[1,23]	3.65[1,8]					3.70[3]	3.70[3]		3.70[3]			
Hi str. low alloy	5.80[1,5]	5.50[1]	5.50[1,8] 6.00[6]				6.00[6]	5.50[3]	5.50[3]		5.50[3]			
MANUFACTURERS' WIRE Bright	4.85[2,5] 5.10[18]	4.85[3] 4.35,34		4.85[3]			4.85[6]	Kokomo—4.95[30] 4.85[35]			4.85[3]	4.95[3]	Duluth—4.85[3]	
PILING, Steel Sheet	4.45[1]	4.45[1]	4.45[3]						4.45[3]					

STEEL PRICES

Smaller numbers indicate producing companies. See key at right. Prices are in cents per lb unless otherwise noted. Extras apply.

Kansas City	Houston	Birmingham	WEST COAST Seattle, San Francisco, Los Angeles, Fontana		
			F=$79.00[19]		INGOTS Carbon forging, net ton
	$82.00[83]		F=$80.00[19]		Alloy, net ton
		$56.00[11]	F=$75.00[19]		BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton
	$74.00[83]	$66.00[11]	F=$85.00[19] SF, LA, S=$85.00[62]	Geneva=$66.00[16]	Carbon forging billets, net ton
	$78.00[83]		F=$89.00[19] LA=$90.00[62]		Alloy net ton
					PIPE SKELP
	4.50[82]	4.10[4,11]	SF=4.90[3], F=4.90[19] LA=4.90[24,62]	Worcester=4.40[2] Minnequa=4.35[14] Portsmouth=4.30[20]	WIRE RODS
		3.60[4,11]	SF, LA=4.30[24] F=4.55[19]	Niles=5.25[84], Geneva=3.70[16] Ashland=3.80[7]	SHEETS Hot-rolled (18 ga. & hvr.)
		4.35[11]	SF=5.30[24] F=5.30[19]		Cold-rolled
		4.80[4,11]	SF, LA=5.55[24]	Ashland=4.80[7] Kokomo=5.20[20]	Galvanized (10 gage)
				Ashland=4.65[7]	Enameling (12 gage)
					Long ternes (10 gage)
		5.40[11]	F=6.35[19]		Hi str. low alloy, h.r.
			F=7.50[19]		Hi str. low alloy, c.r.
					Hi str. low alloy, galv.
4.10[83]	4.90[83]	3.50[4,11]	SF, LA=4.25[24,62] F=4.75[19], S=4.50[62]	Atlanta=4.05[85] Minnequa=4.55[14] Ashland=3.50[7]	STRIP Hot-rolled
			F=6.30[19] LA=6.40[27]	New Haven=5.15[3], 5.85[88] Trenton=6.00[45]	Cold-rolled
		5.30[11]	F=6.20[19] SF, LA=6.05[62] S=6.30[62]		Hi str. low alloy, h.r.
			F=6.95[19]		Hi str. low alloy, c.r.
		$8.55[11]	SF=9.20[24]		TINPLATE Cokes, 1.25-lb base box (1.50 lb, add 25¢)
					Electrolytic 0.25, 0.50, 0.75 lb box
					BLACKPLATE, 29 gage Hollowware enameling
4.30[83]	4.10[83]	3.70[4,11]	SF, LA=4.40[24]	Atlanta=4.25[85] Minnequa=4.15[14]	BARS Carbon steel
4.30[83]	4.10[83]	3.70[4,11]	SF, S=4.45[62] F=4.40[19], LA=4.40[62]	Atlanta=4.25[85] Minnequa=4.50[14]	Reinforcing
			LA=6.00[4]	Newark=5.00[89] Putnam=5.10[89] Hartford=5.10[4]	Cold-finished
4.90[83]	4.70[83]		LA=5.35[62] F=5.35[19]		Alloy, hot-rolled
				Newark=5.75[89] Worcester=5.75[2] Hartford=5.85[4]	Alloy, cold-drawn
		5.55[11]	F=6.60[19] SF, S=6.30[62] LA=6.25[62]		Hi str. low alloy, h.r.
	4.10[83]	3.70[4,11]	F=4.30[19] S=4.60[62]	Claymont=4.15[29] Coatesville=4.15[31] Minnequa=4.50[14] Geneva=3.70[16]	PLATE Carbon steel
				Harrisburg=5.25[38]	Floor plates
			F=5.70[19]	Coatesville=5.25[31] Claymont=4.85[29]	Alloy
		5.65[11]	F=6.25[19] S=6.55[62]	Geneva=5.65[16]	Hi str. low alloy
4.25[83]	4.05[83]	3.60[5] 3.65[11]	SF=4.20[83] F=4.25[18] LA=4.25[24,62] S=4.30[62]	Geneva 3.65[16] Minnequa 4.10[14]	SHAPES, Structural
		5.50[11]	S,F=6.10[62,19] SF=6.00[62] LA=6.05[62]	Geneva=5.50[16]	Hi str. low alloy
5.45[83]	5.25[83]	4.85[4,11]	SF, LA=5.80[24]	Atlanta=5.10[85] Worcester=5.15[2] Minnequa=5.10[14] Portsmouth=5.25[20]	MANUFACTURERS' WIRE Bright

KEY TO STEEL PRODUCERS

1 U. S. Steel Co., Pittsburgh
2 American Steel & Wire Co., Cleveland
3 Bethlehem Steel Co., Bethlehem
4 Republic Steel Corp., Cleveland
5 Jones & Laughlin Steel Corp., Pittsburgh
6 Youngstown Sheet & Tube Co., Youngstown
7 Armco Steel Corp., Middletown, Ohio
8 Inland Steel Co., Chicago
9 Weirton Steel Co., Weirton, W. Va.
10 National Tube Co., Pittsburgh
11 Tennessee Coal, Iron & R. R. Co., Birmingham
12 Great Lakes Steel Corp., Detroit
13 Sharon Steel Corp., Sharon, Pa.
14 Colorado Fuel & Iron Corp., Denver
15 Wheeling Steel Corp., Wheeling, W. Va.
16 Geneva Steel Co., Salt Lake City
17 Crucible Steel Co. of America, New York
18 Pittsburgh Steel Co., Pittsburgh
19 Kaiser Steel Corp., Oakland, Calif.
20 Portsmouth Div., Detroit Steel Corp., Detroit
21 Lukens Steel Co., Coatesville, Pa.
22 Granite City Steel Co., Granite City, Ill.
23 Wisconsin Steel Co., South Chicago, Ill.
24 Columbia Steel Co., San Francisco
25 Copperweld Steel Co., Glassport, Pa.
26 Alan Wood Steel Co., Conshohocken, Pa.
27 Calif. Cold Rolled Steel Corp., Los Angeles
28 Allegheny Ludlum Steel Corp., Pittsburgh
29 Claymont Steel Corp., Claymont, Del.
30 Continental Steel Corp., Kokomo, Ind.
31 Rotary Electric Steel Co., Detroit
32 Laclede Steel Co., St. Louis
33 Northwestern Steel & Wire Co., Sterling, Ill.
34 Keystone Steel & Wire Co., Peoria, Ill.
35 Central Steel & Wire Co., Harrisburg, Pa.
36 Carpenter Steel Co., Reading, Pa.
37 Eastern Stainless Steel Corp., Baltimore
38 Washington Steel Corp., Washington, Pa.
39 Jessop Steel Co., Washington, Pa.
40 Blair Strip Steel Co., New Castle, Pa.
41 Superior Steel Corp., Carnegie, Pa.
42 Timken Steel & Tube Div., Canton, Ohio
43 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
44 Reeves Steel & Mfg. Co., Dover, Ohio
45 John A. Roebling's Sons Co., Trenton, N. J.
46 Simonds Saw & Steel Co., Fitchburg, Mass.
47 McLouth Steel Corp., Detroit
48 Cold Metal Products Co., Youngstown
49 Thomas Steel Co., Warren, Ohio
50 Wilson Steel & Wire Co., Chicago
51 Sweet's Steel Co., Williamsport, Pa.
52 Superior Drawn Steel Co., Monaca, Pa.
53 Tremont Nail Co., Wareham, Mass.
54 Firth Sterling St. & Carbide Corp., McKeesport
55 Ingersoll Steel Div., Chicago
56 Phoenix Iron & Steel Co., Phoenixville, Pa.
57 Fitzsimons Steel Co., Youngstown
58 Stanley Works, New Britain, Conn.
59 Universal-Cyclops Steel Corp., Bridgeville, Pa.
60 American Cladmetals Co., Carnegie, Pa.
61 Cuyahoga Steel & Wire Co., Cleveland
62 Bethlehem Pacific Coast Steel Corp., San Fran.
63 Follansbee Steel Corp., Pittsburgh
64 Niles Rolling Mill Co., Niles, Ohio
65 Atlantic Steel Co., Atlanta
66 Acme Steel Co., Chicago
67 Joslyn Mfg. & Supply Co., Chicago
68 Detroit Steel Corp., Detroit
69 Wycoff Steel Co., Pittsburgh
70 Bliss & Laughlin, Inc., Harvey, Ill.
71 Columbia Steel & Shafting Co., Pittsburgh
72 Cumberland Steel Co., Cumberland, Md.
73 La Salle Steel Co., Chicago
74 Monarch Steel Co., Inc., Hammond, Ind.
75 Empire Steel Co., Mansfield, Ohio
76 Mahoning Valley Steel Co., Niles, Ohio
77 Oliver Iron & Steel Co., Pittsburgh
78 Pittsburgh Screw & Bolt Co., Pittsburgh
79 Standard Forging Corp., Chicago
80 Driver Harris Co., Harrison, N. J.
81 Detroit Tube & Steel Div., Detroit
82 Reliance Div., Eaton Mfg. Co., Massillon, Ohio
83 Sheffield Steel Corp., Kansas City
84 Plymouth Steel Co., Detroit
85 Wickwire Spencer Steel, Buffalo
86 Angell Nail and Chaplet, Cleveland
87 Mid-States Steel & Wire, Crawfordsville, Ind.
88 National Supply, Pittsburgh, Pa.
89 Wheatland Tube Co., Wheatland, Pa.
90 Mercer Tube & Mfg. Co., Sharon, Pa.
91 Woodward Iron Co., Woodward, Ala.
92 Sloss-Sheffield Steel & Iron Co., Birmingham
93 Hanna Furance Corp., Detroit
94 Interlake Iron Corp., Cleveland
95 Lone Star Steel Co., Dallas
96 Mystic Iron Works, Everett, Mass.
97 Jackson Iron & Steel Co., Jackson, O.
98 Globe Iron Co., Jackson, O.
99 Pittsburgh Coke & Chemical Co., Pittsburgh
100 Shenango Furnace Co., Pittsburgh
101 Tennessee Products & Chem. Corp., Nashville
102 Koppers Co., Inc., Granite City, Ill.
103 Page Steel & Wire Div., American Chain & Cable., Monessen, Pa.
104 Wallingford Steel Co., Wallingford, Conn.

STAINLESS STEELS

Base price, cents per lb, f.o.b. mill.

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	14.25	15.00	16.50	16.00	24.25	19.75	21.50	12.75	14.75	13.00
Slabs, billets rerolling	18.50	19.75	21.75	20.75	31.75	26.00	28.25	16.50	20.00	16.75
Forg. discs, die blocks, rings	34.00	34.00	36.50	35.50	52.50	40.00	44.50	28.00	28.50	28.50
Billets, forging	26.25	26.25	28.25	27.50	41.00	31.00	34.75	21.50	22.00	22.00
Bars, wires, structurals	31.25	31.25	33.75	32.75	48.75	38.75	41.25	25.75	26.25	26.25
Plates	33.00	33.00	35.00	35.00	51.50	40.50	45.00	27.00	27.50	27.50
Sheets	41.00	41.00	43.00	41.00	56.50	49.00	53.50	36.50	37.00	39.00
Strip, hot-rolled	26.50	26.00	32.25	30.00	46.25	36.75	41.00	23.50	30.25	24.00
Strip, cold-rolled	34.00	36.50	40.00	38.50	59.50	48.00	52.00	30.50	37.00	31.00

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38 (type 316 add 5¢), 39; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Ft. Wayne, Ind., 67; Lockport, N. Y., 45.

Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38 (type 316 add 5¢); W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 80; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, Pa., 13; Butler, Pa., 7; Wallingford, Conn., 104.

Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42; Ft. Wayne, Ind., 67.

Wire: Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Ft. Wayne, Ind., 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28; Monessen, 103; Syracuse, N. Y., 17; Bridgeville, Pa., 59.

Structurals: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44; Syracuse, N. Y., 17.

Plates: Brackenridge, Pa., 28 (type 416 add ½¢); Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

Forged discs, die blocks, rings: Pittsburgh, 1, 17; Syracuse, 17; Ferndale, Mich., 28; Washington, Pa., 39.

Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1; Syracuse, N. Y., 17.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Axles	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer-1	3.60	4.00	4.70					
Chicago-4				6.15				
Ensley-11	3.60	4.00						
Fairfield-11		4.00	4.40			6.00	4.80	
Gary-1	3.60	4.00					4.80	
Ind. Harbor-8	3.60		4.70	6.15	5.25	6.00	4.80	
Johnstown-3		4.00			5.60	6.60		
Joliet-1		4.00	4.70					
Kansas City-83				6.40				9.00
Lackawanna-3	3.60	4.00	4.70			6.00	4.80	
Lebanon-3				6.15				9.00
Minnequa-14	3.60	4.50	4.70	6.15		6.60	4.80	9.00
Pittsburgh-77						6.35		9.00
Pittsburgh-78								9.00
Pittsburgh-5				6.15				
Pittsburg-24							4.80	
Seattle-62				6.10			4.35	
Steelton-3	3.60		4.70				4.80	
Struthers-6				6.15				
Torrance-24							4.85	
Youngstown-4				6.15				

BOILER TUBES

$ Per 100 ft., cut, 10 to 24 ft.

F.o.b. Mill	Size		Seamless		Elec. Weld	
	Od-In.	B. W. Ga.	H. R.	C.D.	H. R.	C.D.
Babcock & Wilcox	2	13	22.67	26.66	21.99	25.86
	2½	12	30.48	35.84	29.57	34.76
	3	12	33.90	39.90	32.89	38.70
	3½	11	42.37	49.89	41.10	48.39
	4	10	52.60	61.88	51.03	60.02
National Tube	2	13	21.62	26.48		
	2½	12	29.65	36.32		
	3	12	34.00	41.64		
	3½	11	40.34	49.41		
	4	10	51.21	62.72		
Pittsburgh Steel	2	13		27.08		
	2½	12	30.49	37.15		
	3	12	34.95	42.89		
	3½	11	41.48	50.54		
	4	10	52.56	64.16		

FLUORSPAR

Washed gravel, f.o.b. Rosiclaire, Ill.
Price, net ton: Effective CaF₂ content:
70% or more $43.00
60% or less 40.00

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Base Col.	Woven Wire Fence 9-15½ ga. Base Col.	Fence Posts Base Col.	Single Loop Bale Ties Base Col.	Twisted Barbless Wire Base Col.	Galv. Barbed Wire Base Col.	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. (1) ¢/lb.
Alabama City-4	118	126	....	123	....	136	5.70	5.95
Aliquippa, Pa.-5	118	132	....	....	136	140	5.70	6.15
Atlanta-65	121	133	....	126	126	143	5.95	6.40
Bartonville-34	118	130	140	123	143	143	5.95	6.15
Buffalo-85	....	....	....	....	....	....	4.85	....
Cleveland-86	125	....	....	....	....	....	....	....
Cleveland-2	....	....	....	....	....	....	5.70	6.15
Crawfordsville-87	....	132	....	....	....	145	5.95	6.40
Donora, Pa.-2	118	130	....	123	140	140	5.70	6.15
Duluth-2	118	130	....	123	140	140	5.70	6.15
Fairfield, Ala.-11	118	130	....	123	....	136	5.70	6.15
Houston-83	126	138	....	....	....	148	6.10	6.55
Johnstown, Pa.-3	118	130	....	....	140	....	5.70	6.15
Joliet, Ill.2	118	130	....	123	....	140	5.70	6.15
Kokomo, Ind.-30	120	132	....	125	138	138	5.80	6.05
Los Angeles-62	....	....	....	....	....	....	6.65	....
Kansas City-83	130	130	142	135	....	152	6.30	6.75
Minnequa-14	123	138	130	128	146	146	5.95	6.45
Monessen-18	124	135	....	....	....	145	5.95	6.40
Moline, Ill.-4	....	....	136	....	....	....	....	....
Palmer-85	....	....	....	....	....	....	....	....
Pittsburg, Cal.-24	137	149	....	147	156	160	6.65	6.80
Portsmouth-20	124	137	....	....	147	147	6.10	6.60
Rankin, Pa.-2	118	130	....	....	140	140	5.70	6.15
So. Chicago, Ill.-4	118	126	140	123	....	136	5.70	5.95
S. San Fran.-14	....	....	....	147	....	160	6.65	7.10
Sparrows Pt.-3	120	....	....	125	142	142	5.80	6.25
Sterling, Ill.-33	118	130	140	123	140	140	5.70	6.15
Struthers, Ohio-6	....	....	....	....	....	....	5.70	6.15
Torrance, Cal.-24	138	....	....	....	....	....	6.65	....
Worcester-2	124	....	....	....	....	....	6.00	6.45
Williamsport, Pa.-51	....	....	150	....	....	....	....	....

Cut Nails, carloads, base, $6.75 per 100 lb. (less 20¢ to jobbers), at Conshohocken, Pa., (26), Wareham, Mass. (53), Wheeling, W. Va., (15).

(1) Alabama City and So. Chicago do not include zinc extra.

CAST IRON WATER PIPE

	Per Net Ton
6 to 24-in., del'd Chicago	$105.30 to $108.80
6 to 24-in., del'd N. Y.	108.50 to 109.50
6 to 24-in., Birmingham	91.50 to 96.00

6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less ..... $108.50 to $113.00

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

PIPE AND TUBING

Base discounts, f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS					
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½-3 In.		3½-4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
STANDARD T. & C.																				
Sparrows Pt.-3	34.0	12.0	37.0	16.0	39.5	19.5	40.0	20.0	40.5	21.0	41.0	21.5	41.5	22.0	....	....	....	....	....	....
Cleveland-4	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	....	....	....	....	....	....
Oakland-19	25.0	3.0	28.0	7.0	30.5	10.5	31.0	11.0	31.5	12.0	32.0	12.5	32.5	13.0	....	....	....	....	....	....
Pittsburgh-5	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	29.5	8.0	32.5	11.5	34.5	13.5
Pittsburgh-10	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	9.5	32.5	12.5	34.5	14.5
St. Louis-32	36.0	13.0	38.0	17.0	40.5	20.5	41.0	21.0	41.5	22.0	42.0	22.5	42.5	23.0	....	....	....	....	....	....
Sharon-90	36.0	13.0	39.0	17.0	41.5	20.0	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.0	....	....	....	....	....	....
Pittsburgh-88	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	....	32.5	....	34.5	....
Wheeling-15	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	....	....	....	....	....	....
Wheatland-89	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	....	....	....	....	....	....
Youngstown-6	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	9.5	32.5	12.5	34.5	14.5
EXTRA STRONG, PLAIN ENDS																				
Sparrows Pt.-3	33.5	13.0	37.5	17.0	39.5	20.5	40.0	21.0	40.5	22.0	41.0	22.5	41.5	23.0	....	....	....	....	....	....
Cleveland-4	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	....	....	....	....	....	....
Oakland-19	24.5	4.0	28.5	8.0	30.5	11.5	31.0	12.0	31.5	13.0	32.0	13.5	32.5	14.0	....	....	....	....	....	....
Pittsburgh-5	35.5	13.5	39.5	17.5	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	29.0	7.5	33.0	12.0	36.5	16.5
Pittsburgh-10	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0	10.0	33.0	14.0	36.5	17.5
St. Louis-32	34.5	14.0	38.5	18.0	40.5	21.5	41.0	22.0	41.5	23.0	42.0	23.5	42.5	24.0	....	....	....	....	....	....
Sharon-90	35.5	14.0	39.5	18.0	41.5	21.0	42.0	21.5	42.5	22.0	43.0	22.5	43.5	23.0	....	....	....	....	....	....
Pittsburgh-88	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0	....	33.0	....	36.5	....
Wheeling-15	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	....	....	....	....	....	....
Wheatland-89	35.5	13.5	39.5	17.5	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	....	....	....	....	....	....
Youngstown-6	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0	10.0	33.0	14.0	36.5	17.5

† Galvanized discounts based on zinc at 17¢ per lb, East St. Louis. For each 1¢ change in zinc, discounts vary as follows: ½ in., ¾ in., and 1 in., 1 pt.; 1¼ in., 1½ in., 2 in., ¾ pt.; 2½ in., 3 in., ½ pt. Calculate discounts on even cents per lb of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb, use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢.

Threads only, buttweld and seamless, 1 pt. higher discount. Plain ends, buttweld and seamless, 3 in. and under, 2½ pts. higher discount. Buttweld jobbers' discount, 8 pct.

WAREHOUSES

Base price, f.o.b., dollars per 100 lb. *(Metropolitan area deliver add 20¢ except Birmingham, San Francisco, Cincinnati, New Orleans St. Paul, add 15¢; Memphis, add 10¢; Philadelphia, add 25¢; New York, add 30¢).

Cities	Sheets			Strip		Plates	Shapes	Bars		Alloy Bars			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled A 4615 As rolled	Hot-Rolled A 4140 Annealed	Cold-Drawn A 4615 As rolled	Cold-Drawn A 4140 Annealed
Baltimore	5.60	6.84	7.49[2]–8.07	6.04	.....	5.80	6.14	6.04	6.84–6.89	10.24	10.54	11.89	12.19
Birmingham*	5.60	6.40	6.75	5.55	.....	5.95	5.70	5.55	.....	.....	.....	.....	.....
Boston	6.20	7.00–7.25	7.74–8.29	6.15	8.50[4]	6.48–6.78	6.20	6.05	6.79–6.84	10.25	10.55	11.90–12.00	12.20–12.30
Buffalo	5.60	6.40	7.74–8.09	5.86	.....	6.05	5.80	5.60	6.40–6.45	10.15–10.85	10.45	11.80	11.95–12.10
Chicago	5.60	6.40	7.75	5.55	.....	5.80	5.70	5.55	6.30	9.80	10.10	11.45	11.75
Cincinnati*	5.87	6.44	7.39	5.80	.....	6.19	6.09	5.80	6.61	10.15	10.45	11.80	12.10
Cleveland	5.60	6.40	8.10	5.69	6.90	5.92	5.82	5.57	6.40	9.91	10.21	11.56	11.86
Detroit	5.78	6.53	7.89	5.94	.....	5.99	6.09	5.84	6.56	10.11	10.41	11.76	12.06
Houston	7.00	8.25	.....	.....	.....	8.85	8.80	6.65	9.35	10.35	11.25	.....	12.75
Indianapolis, del'd.	6.00	6.80	8.15	5.95	.....	6.20	6.10	5.95	6.80	.....	.....	.....	.....
Kansas City	6.00	6.80	7.45	6.15	7.50	6.40	6.30	6.15	7.00	10.40	10.70	12.05	12.33
Los Angeles	6.35	7.90	8.85	6.40	9.45[5]	6.40	6.35	6.35	8.20	11.30	11.30	13.20	13.50
Memphis*	6.33–6.38	7.08–7.18	.....	6.33–6.38	.....	6.43–8.02	6.33–6.48	6.08–6.33	7.16–7.32	.....	.....	.....	.....
Milwaukee	5.74	6.54	7.89	5.69–6.59	.....	5.94	5.84	5.69	6.44–6.54	9.94	10.24	11.59	11.89
New Orleans*	5.70	6.59	.....	5.75	7.25	5.95	5.75	5.75	7.30	.....	.....	.....	.....
New York*	5.67–5.97	7.19[5]–7.24[1]	8.14[2]	6.29–6.89	8.63[4]	6.28–6.58	6.10	6.12	6.99	10.05–10.15	10.35–10.45	11.70–11.80	12.10–12.20
Norfolk	6.50[3]	.....	.....	.....	.....	6.50[3]	6.60[3]	6.55[3]	.....	.....	.....	.....	.....
Philadelphia*	5.90	6.80	8.00	6.10	.....	6.05	5.90	6.05	6.88	9.90	10.20	.....	.....
Pittsburgh	5.60	6.40	7.75	5.65–5.95	.....	5.75	5.70	5.55	6.15	9.80	10.10	11.45	11.75
Portland	6.60–7.55	8.95	8.50–9.10	7.30	.....	6.80	6.95	6.90	.....	.....	12.15	.....	.....
Salt Lake City	7.95	.....	9.70–10.50[2]	8.70–8.75	.....	8.05	6.75–8.30	7.95–8.65	9.00	.....	.....	.....	.....
San Francisco*	6.65	8.05[2]	8.55–8.90[2]	6.60	9.45[5]	6.50	6.45	6.45	8.20	11.30	11.30	13.20	13.20–13.50
Seattle	7.05	8.60	9.20	9.05	.....	6.75	6.85	6.75	9.05	.....	.....	.....	.....
St. Louis	5.80–5.85	6.65	8.00	5.80	8.00[4]–8.28	6.13	6.03	5.80	6.55–6.65	10.05	10.35	11.70	12.00
St. Paul*	6.16	6.96	8.31	6.11	.....	6.36	6.26	6.11	6.96	10.36	10.66	12.01	12.31

BASE QUANTITIES (Standard unless otherwise keyed): Cold finished bars; 2000 lb or over. Alloy bars; 1000 to 1999 lb. All others; 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity.
EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 400 to 1999 lb; (4) 6000 lb and over; (5) 1500 to 9999 lb; (6) 2000 to 5999 lb.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Blast Furnace Silvery	Low Phos. Charcoal
Bethlehem-3	54.00	54.50	55.00	55.50	.....	.....	.....
Birmingham-4	48.38	48.88	.....	.....	.....	.....	.....
Birmingham-91	48.38	48.88	.....	.....	.....	.....	.....
Birmingham-92	48.38	48.88	.....	.....	.....	.....	.....
Buffalo-4	52.00	52.50	53.00	.....	.....	.....	.....
Buffalo-93	52.00	52.50	53.00	.....	.....	63.75	.....
Chicago-94	52.00	52.50	52.50	53.00	.....	.....	.....
Cleveland-2	52.00	52.50	52.50	53.00	57.00	.....	.....
Cleveland-4	52.00	52.50	52.50	.....	.....	.....	.....
Daingerfield, Tex.-95	48.00	48.50	48.50	.....	.....	.....	.....
Duluth-94	52.00	52.50	52.50	53.00	.....	.....	.....
Erie-94	52.00	52.50	52.50	53.00	.....	.....	.....
Everett, Mass.-96	.....	53.25	53.75	.....	.....	.....	.....
Fontana-19	58.00	58.50	.....	.....	.....	.....	.....
Geneva, Utah-16	52.00	52.50	52.50	53.00	.....	.....	.....
Granite City, Ill.-102	53.90	54.40	54.90	.....	.....	.....	.....
Hubbard, Ohio-6	52.00	52.50	52.50	.....	.....	.....	.....
Ironton, Utah-16	52.00	52.50	.....	.....	.....	.....	.....
Jackson, Ohio-97, 98	.....	.....	.....	.....	.....	52.50	.....
Lyle, Tenn.-101	.....	.....	.....	.....	.....	.....	66.00
Monessen-18	54.00	.....	.....	.....	.....	.....	.....
Neville Island-99	52.00	52.50	52.50	53.00	.....	.....	.....
Pittsburgh-1	52.00	.....	.....	53.00	.....	.....	.....
Sharpsville-100	52.00	52.50	52.50	53.00	.....	.....	.....
Steelton-3	54.00	54.50	55.00	55.50	60.00	.....	.....
Swedeland-26	56.00	56.50	57.00	57.50	.....	.....	.....
Toledo-94	52.00	52.50	52.50	53.00	.....	.....	.....
Troy, N. Y.-4	54.00	54.50	55.00	.....	60.00	.....	.....
Youngstown-6	52.00	52.50	52.50	53.00	.....	.....	.....

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.75 pct nickel. Subtract 38¢ per ton for phosphorus content over 0.70 pct. Silvery iron: Add $1.50 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. $1 per ton for 0.75 pct or more phosphorus, manganese as above. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

REFRACTORIES

Fire Clay Brick *(F.o.b. works) Carloads, Per 1000*

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5)	$94.60
No. 1 Ohio	88.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	88.00
No. 2 Ohio	79.30
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	13.75

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$94.60
Childs, Pa.	99.00
Hays, Pa.	100.10
Chicago District	104.50
Western Utah and Calif.	111.10
Super Duty, Hays, Pa., Athens, Tex., Chicago	111.10
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	16.50
Silica cement, net ton, bulk, Hays, Pa.	18.70
Silica cement, net ton, bulk, Ensley, Ala.	17.60
Silica cement, net ton, bulk, Chicago District	17.60
Silica cement, net ton, bulk, Utah and Calif.	24.70

Chrome Brick *Per Net Ton*

Standard chemically bonded, Balt., Chester	$82.00

Magnesite Brick

Standard, Baltimore	$104.00
Chemically bonded, Baltimore	93.00

Grain Magnesite *St. ⅝-in. grains*

Domestic, f.o.b. Baltimore, in bulk fines removed	$62.70
Domestic, f.o.b. Chewelah, Wash., in bulk	36.30
in sacks	41.80

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢	$13.00

COKE

	Net Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$14.50 to $15.00
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$17.50 to $18.00
Foundry, oven coke	
Buffalo, del'd	$26.69
Chicago, f.o.b.	23.00
Detroit, f.o.b.	24.00
New England, del'd.	24.80
Seaboard, N. J., f.o.b.	22.00
Philadelphia, f.o.b.	22.70
Swedeland, Pa., f.o.b.	22.60
Painesville, Ohio, f.o.b.	24.00
Erie, Pa., f.o.b.	23.50
Cleveland, del'd	25.72
Cincinnati, del'd	25.06
St. Paul, f.o.b.	22.50
St. Louis	25.40
Birmingham, del'd	21.69
Neville Island	23.00

LAKE SUPERIOR ORES

(51.50% *Fe; natural content, delivered lower lake ports*) *Per gross ton*

Old range, bessemer	$8.70
Old range, nonbessemer	8.55
Mesabi, bessemer	8.45
Mesabi, nonbessemer	8.30
High phosphorus	8.30

After adjustments for analyses, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

C-R SPRING STEEL

F.o.b. Mill Cents Per Lb.	CARBON CONTENT 0.26–0.40	0.41–0.60	0.61–0.80	0.81–1.05	1.06–1.35
Bridgeport, Conn.-58	5.35	6.80	7.40	9.35	11.65
Carnegie, Pa.-41	.....	6.80	7.40	9.35	11.65
Cleveland-2	4.65	6.45	7.40	9.35	11.65
Detroit-68	5.60	6.65	7.25	.....	.....
New Castle, Pa.-40	5.35	6.80	7.40	9.35	.....
New Haven, Conn.-68	5.85	6.75	7.35	.....	.....
Sharon, Pa.-13	5.35	6.80	7.40	9.35	11.65
Weirton, W. Va.-9	5.35	6.80	7.40	9.35	11.65
Worcester, Mass.-2	4.95	6.75	7.70	9.65	11.65
Youngstown-48	.....	6.80	7.40	9.35	11.65

BOLTS, NUTS, RIVETS, SCREWS

Consumer Prices

(Base discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts

	Pct Off List Less Case	C.
½ in. & smaller x 6 in. & shorter	15	28½
9/16 in. & ⅝ in. x 6 in. & shorter	18½	30½
¾ in. & larger x 6 in. & shorter	17½	29½
All diam. longer than 6 in.	14	27½
Lag, all diam. x 6 in. & shorter	23	35
Lag, all diam. longer than 6 in.	21	33
Plow bolts	34	....

Nuts, Hot Pressed, Cold Punched—Sq

	Pct Off List Less Keg (Reg.)	K.	Less Keg (Hvy.)	K.
½ in. & smaller	15	28½	15	28½
9/16 in. & ⅝ in.	12	25	6½	21
¾ in. to 1½ in. inclusive	9	23	1	16½
1⅝ in. & larger	7½	22	1	16½

Nuts, Hot Pressed—Hexagon

½ in. & smaller	26	37	22	34
9/16 in. & ⅝ in.	16½	29½	6½	21
¾ in. to 1½ in. inclusive	12	25	2	17½
1⅝ in. & larger	8½	23	2	17½

Nuts, Cold Punched—Hexagon

½ in. & smaller	26	37	22	34
9/16 in. & ⅝ in.	23	35	17½	30½
¾ in. to 1½ in. inclusive	19½	31½	12	25
1⅝ in. & larger	12	25	6½	21

Nuts, Semi-Finished—Hexagon

	Reg.		Hvy.	
½ in. & smaller	35	45	28½	39½
9/16 in. & ⅝ in.	29½	40½	22	34
¾ in. to 1½ in. inclusive	24	36	15	28½
1⅝ in. & larger	13	26	8½	23
	Light			
7/16 in. & smaller	35	45		
½ in. thru ⅝ in.	28½	39½		
¾ in. to 1½ in. inclusive	26	37		

Stove Bolts — *Pct Off List*

Packaged, steel, plain finished	56—10
Packaged, plated finish	41—10
Bulk, plain finish**	67*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets — *Base per 100 lb.*

½ in. & larger	$7.85
	Pct Off List
7/16 in. & smaller	36

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa.

Cap and Set Screws

(In bulk)	Pct Off List
Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright	54
⅝ in. thru 1 in. up to & including 6 in.	48
¼ in. thru ⅝ in. x 6 in. & shorter high C double heat treat	46
⅝ in. thru 1 in. up to & including 6 in.	41
Milled studs	35
Flat head cap screws, listed sizes	16
Fillister head cap, listed sizes	34
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter	53

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	21.60
Ton lots	23.75
Less ton lots	25.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

ELECTRODES

Cents per lb., f.o.b. plant, threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb.
	GRAPHITE	
17, 18, 20	60, 72	17.85
8 to 16	48, 60, 72	17.85
7	48, 60	19.57
6	48, 60	20.95
4, 5	40	21.50
3	40	22.61
2½	24, 30	23.15
2	24, 30	25.36
	CARBON	
40	100, 110	8.03
35	65, 110	8.03
30	65, 84, 110	8.03
24	72 to 104	8.03
20	84, 90	8.03
17	60, 72	8.03
14	60, 72	8.57
10, 12	60	8.84
8	60	9.10

CLAD STEEL

Base prices, cents per pound, f.o.b. mill

Stainless-carbon	Plate	Sheet
No. 304, 20 pct,		
Coatesville, Pa. (21)	*29.5	
Washgtn, Pa. (39)	*29.5	
Claymont, Del. (29)	*28.00	
Conshohocken, Pa. (26)		*24.00
New Castle, Ind. (55)	*26.50	*25.50
Nickel-carbon		
10 pct Coatesville (21)	32.5	
Inconel-carbon		
10 pct Coatesville (21)	40.5	
Monel-carbon		
10 pct Coatesville (21)	33.5	
No. 302 Stainless-copper-stainless, Carnegie, Pa. (60)		77.00
Aluminized steel sheets, hot dip, Butler, Pa. (7)		7.75

*Includes annealing and pickling, or sandblasting.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.235
18	4	1	—	5	$1.86
18	4	2	—	—	$1.38
1.5	4	1.5	8	—	78.5¢
6	4	2	6	—	.87¢

High-carbon chromium	63.5¢
Oil hardened manganese	35¢
Special carbon	32.5¢
Extra carbon	27¢
Regular carbon	23¢

Warehouse prices on and east of Mississippi are 3¢ per lb higher. West of Mississippi, 5¢ higher.

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.l.f. New York, ocean bags	7.4¢ to 9.0¢
Canadian sponge iron, del'd, in East	10.00¢
Domestic sponge iron, 98+% Fe, carload lots	9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+% Fe	36.0¢ to 39.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe	48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe	83.0¢ to $1.48
Aluminum	29.00¢
Brass, 10 ton lots	30.00¢ to 33.25¢
Copper, electrolytic	10.75¢ plus metal value
Copper, reduced	10.00¢ plus metal value
Cadmium, 100-199 lb.	95¢ plus metal value
Chromium, electrolytic, 99% min., and quantity	$3.50
Lead	7.5¢ to 12.0¢ plus metal value
Manganese	52.00¢
Molybdenum, 99%	$2.65
Nickel, unannealed	88.0¢
Nickel, annealed	95.0¢
Nickel, spherical, unannealed	92.0¢
Silicon	38.5¢
Solder powder	6.5¢ to 8.5¢ plus met. value
Stainless steel, 302	83.00¢
Stainless steel, 316	$1.10
Tin	14.00¢ plus metal value
Tungsten, 99%	$4.15
Zinc, 10 ton lots	23.0¢ to 30.5¢

ELECTRICAL SHEETS

22 Ga. H-R cut lengths

F.o.b. Mill Cents Per Lb.	Armature	Elec.	Motor	Dynamo	Transf. 72	Transf. 65	Transf. 58
Beech Bottom-15	....	7.25	8.50	9.30	9.85	10.40	11.10
Brackenridge-28	....	7.25	8.50	9.30	9.85	....	....
Follansbee-83	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Granite City-22	....	7.95	9.20	....	....	....	....
Ind. Harbor-3	6.75	7.25	....	....	....	....	....
Mansfield-75	7.25	7.75	9.00	9.80	....	....	....
Niles, O.-84	7.05	7.55	....	....	....	....	....
Vandergrift-1	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Warren, O.-4	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Zanesville-7	6.75	7.25	8.50	9.30	9.85	10.40	11.10

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max. Si.)

0.06% C	30.50	0.20% C	29.50
0.10% C	30.00	0.50% C	29.25
0.15% C	29.75	1.00% C	29.00
2.00% C			28.75
65-69% Cr, 4-9% C			22.00
62-66% Cr, 4-6% C, 6-9% Si.			22.85

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.

0.20% Max. C.	$1.09
0.50% max. C.	1.05
.00 min. C.	1.04

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 21.75¢ per lb of contained Cr plus 12.00¢ per lb of contained Si.

Bulk 1-in. x down, 21.90¢ per lb contained Cr plus 12.20¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, dump, delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	19.00
Ton lots	22.10
Less ton lots	23.00

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	20.00
Ton lots	22.20
Less ton lots	23.20

CMSZ

Contract price, cents per lb of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50.56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	20.75
Less ton lots	22.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	16.50¢
Less ton lots	17.75¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.00¢
Ton lots to carload packed	19.00¢
Less ton lots	20.50¢

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.25
Less ton lots	18.50

FERROALLOYS

Ferromanganese

78-82% Mn. maximum contract base price, gross ton, lump size.

F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont., Ashtabula, O.	$185
F.o.b. Johnstown, Pa.	$187
F.o.b. Sheridan, Pa.	$185
F.o.b. Etna, Clairton, Pa.	$188

$2.00 for each 1% above 82% Mn, penalty, $2.15 for each 1% below 78%.

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	10.95
Ton lots	12.55

Spiegeleisen

Contract prices gross ton, lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$74.00	$75.00
Pgh. or Chicago	74.00	75.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, packed	29.75
Ton lots	31.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	28
Ton lots	30
Less ton lots	32

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb. of contained Mn .19.15¢

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.

Carload bulk	9.90
Ton lots	11.55
Briquet, contract basis carlots, bulk delivered, per lb of briquet	11.15
Ton lots	11.75

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $92.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $83.00. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	21.70
97% Si, 1% Fe	22.10

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 1 lb Si briquets.

Carload, bulk	6.95
Ton lots	8.55

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	19.00	75% Si	14.30
50% Si	12.40	85% Si	15.55
90-95% Si			17.50

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd, Mn 85-90%.

	Carloads	Ton	Less
0.7% max. C, 0.06% P, 90% Mn	26.25	28.10	29.30
0.07% max. C	25.75	27.60	28.80
0.15% max. C	25.25	27.10	28.30
0.30% max. C	24.75	26.60	27.80
0.50% max. C	24.25	26.10	27.30
0.75% max. C, 7.00% max. Si	21.25	23.10	24.30

Other Ferroalloys

Alsifer, 20%, Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	9.90¢
Ton lots	11.30¢
Calcium molybdate, 45-40%, f.o.b. Langeloth, Pa., per pound contained Mo.	$1.15
Ferrocolumbium, 50-60%, 2 in x D, contract basis, delivered, per pound contained Cb.	
Ton lots	$4.90
Less ton lots	4.95
Ferro - Tantalum - columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta	$3.75
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo.	$1.32
Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton	$65.00
10 tons to less carload	75.00
Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	$1.35
Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	$1.50
Less ton lots	$1.55
Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton	$177.00
Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered	$3.25
Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.	
Openhearth	$3.00-$3.05
Crucible	3.10- 3.15
High speed steel (Primos)	3.25
Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa.	$1.14
bags, f.o.b. Washington, Pa., Langeloth, Pa.	$1.13
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk lump	14.50¢
Ton lots, bulk lump	15.75¢
Less ton lots, lump	16.25¢
Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound contained V_2O_5	$1.28
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00¢
Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.	
Carload, bulk	7.00¢

Boron Agents

Contract prices per lb of alloy, del.

Borosil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B	$5.25
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.	
Ton lots, per pound	10.00¢
Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots	$1.20
F.o.b. Wash., Pa.; 100 lb up	
10 to 14% B	.75
14 to 19% B	1.20
19% min. B	1.50
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	
No. 1	$1.00
No. 6	68¢
No. 79	50¢
Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.	
Ton lots	$1.46
Less ton lots	1.57
Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	
Less ton lots	$1.80
Silcax, contract basis, delivered.	
Ton lots	45.00¢

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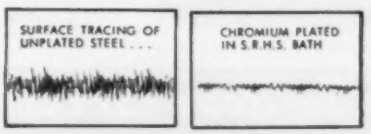

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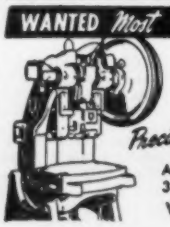

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